

# MaxIm DL

Materiał na szkolenie z obsługi programu

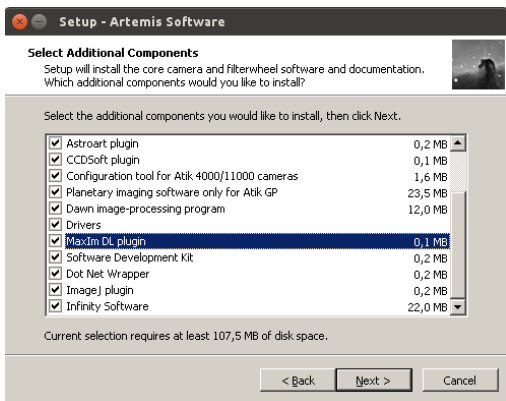
Ernest Świerczyński

8 grudnia 2015

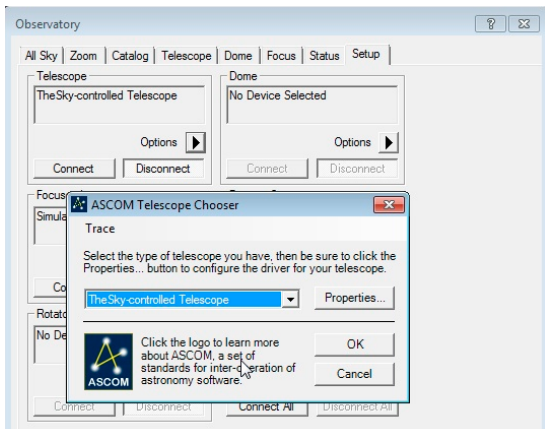
# Połączenie z teleskopem i kamerą



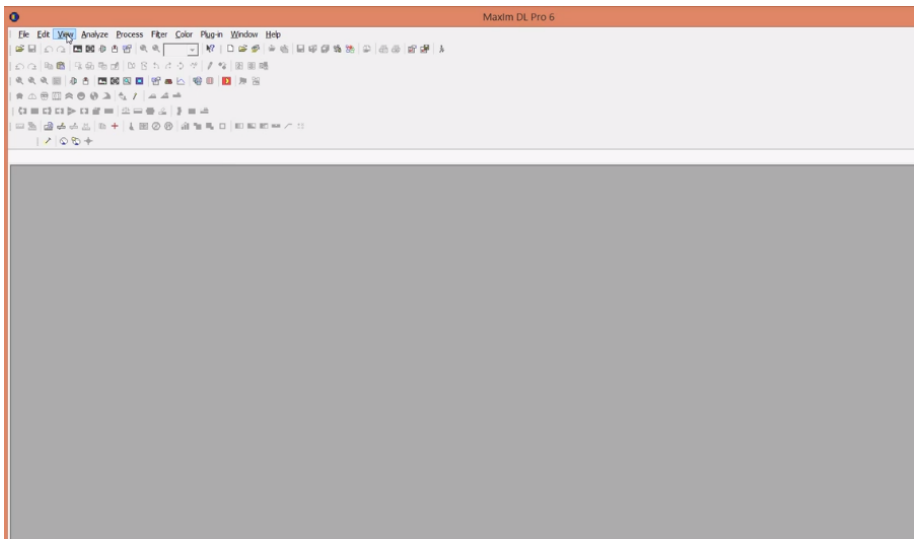
podczas instalacji kamery Atik, przy wyborze składników zaznaczamy opcję MaximDL plugin lub znajdujemy plik .exe na płycie CD



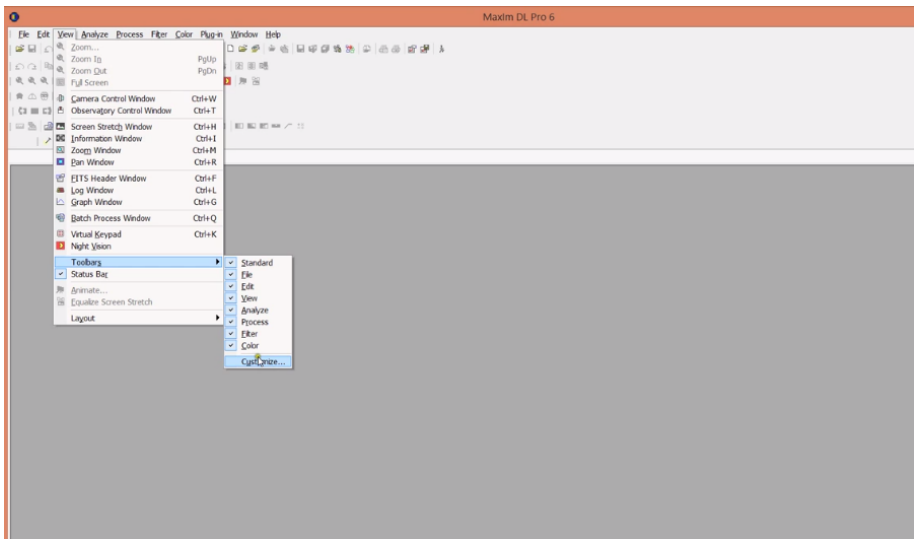
potrzebujemy zainstalować sterowniki i pluginy do obsługi teleskopu, które będą wykorzystane przez program (standard ASCOM)



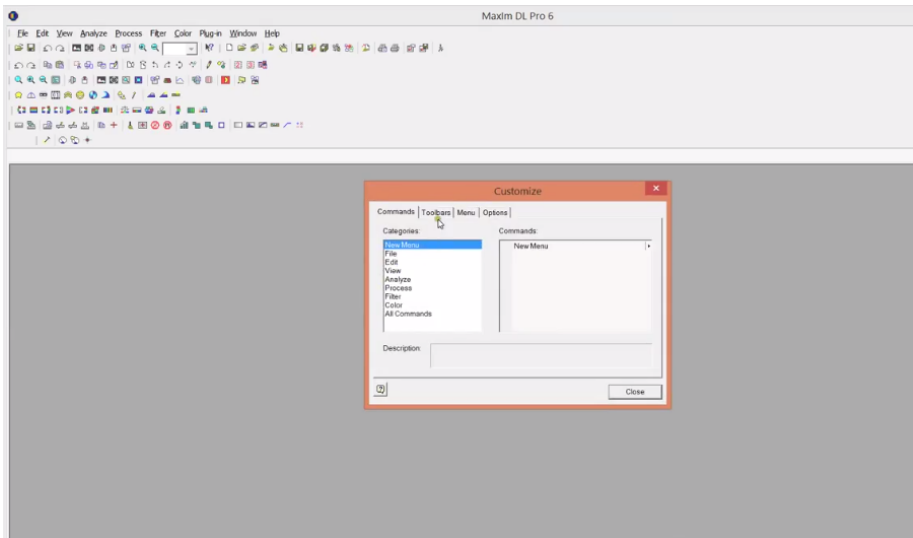
porządkujemy widok programu usuwając rzadziej używane ikony



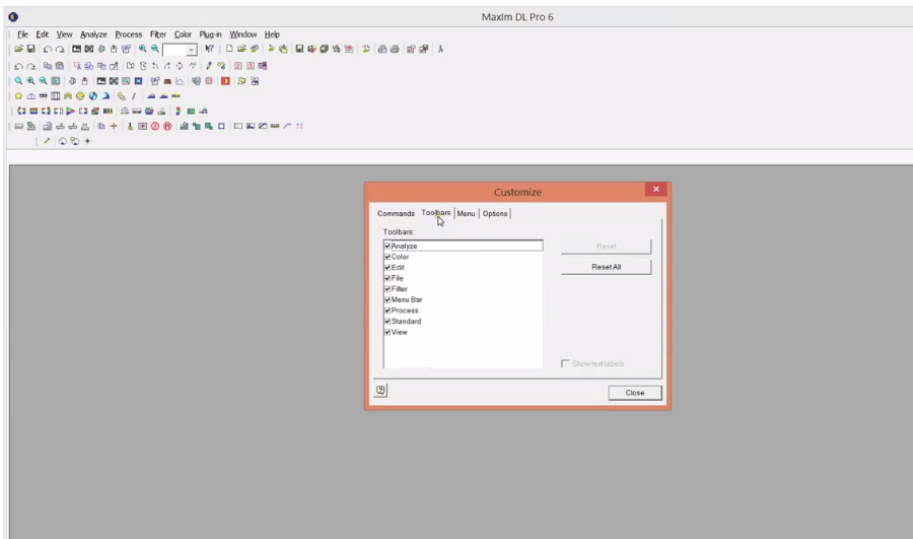
## View → Toolbars → Customize

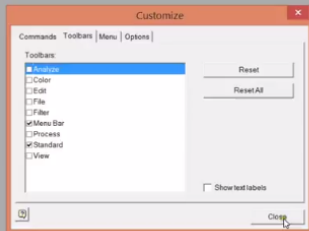


## Toolbars

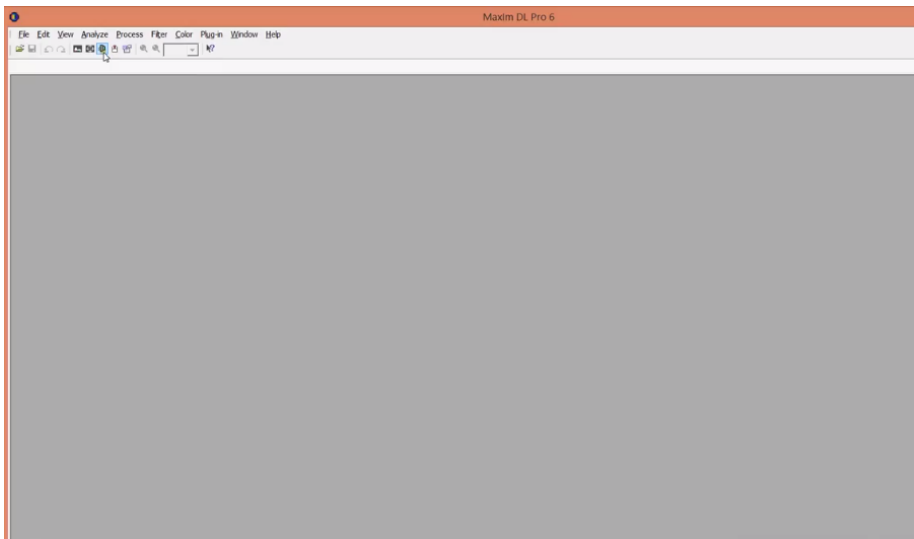


Oznaczamy większość opcji, zostawiając najważniejsze ikony



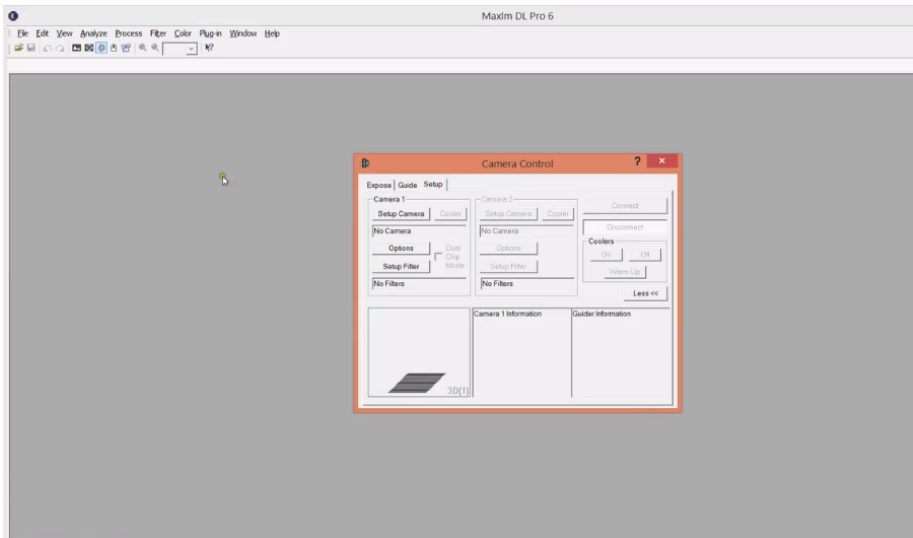


## wybór i konfiguracja kamery CCD






# Setup Camera

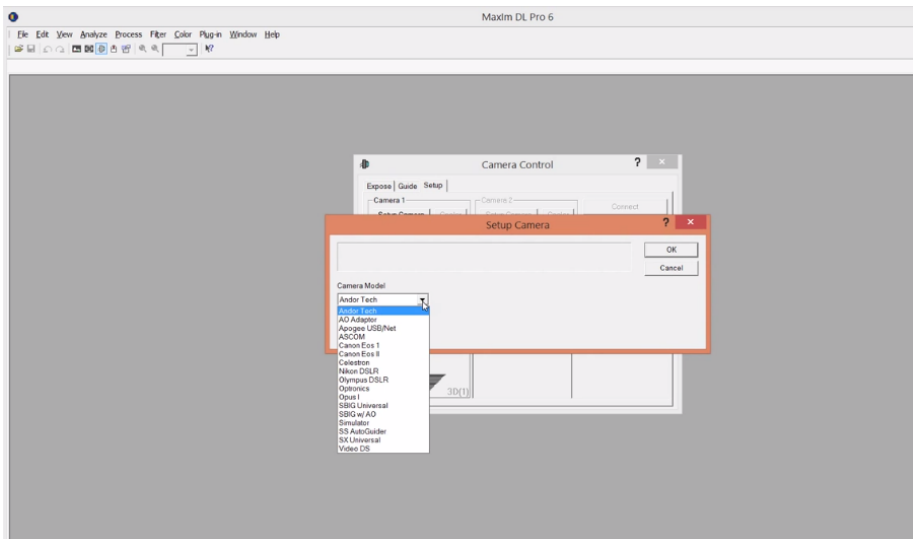


Camera Control

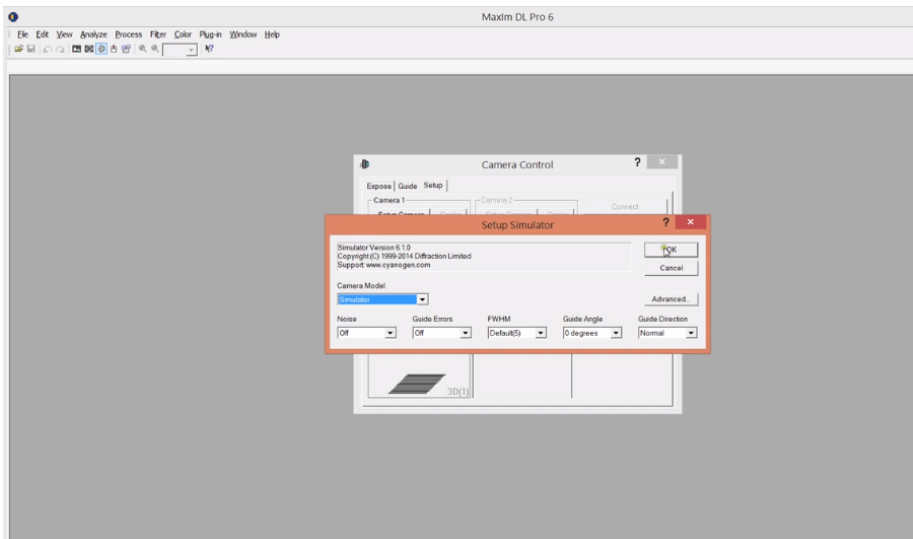
Expose | Guide | Setup

<b>Camera 1</b> Cooler No Camera Options Setup Filter No Filters	<b>Camera 2</b> Setup Camera Cooler No Camera Options Setup Filter No Filters	Connect Disconnect Coolers On Off Warm Up Less <<
 3D(1)	Camera 1 Information	Guider Information

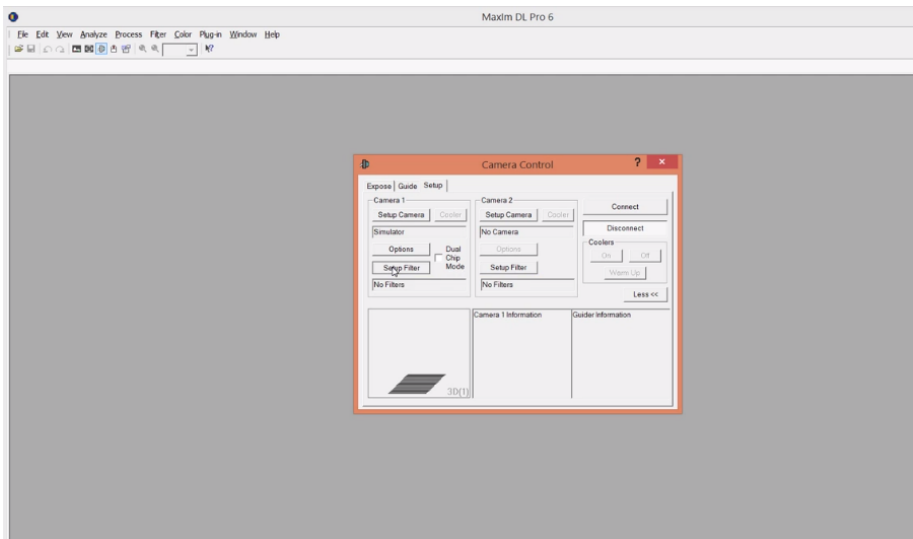
wybieramy model kamery, w naszym przypadku najczęściej jest ukryta pod nazwą Artemis



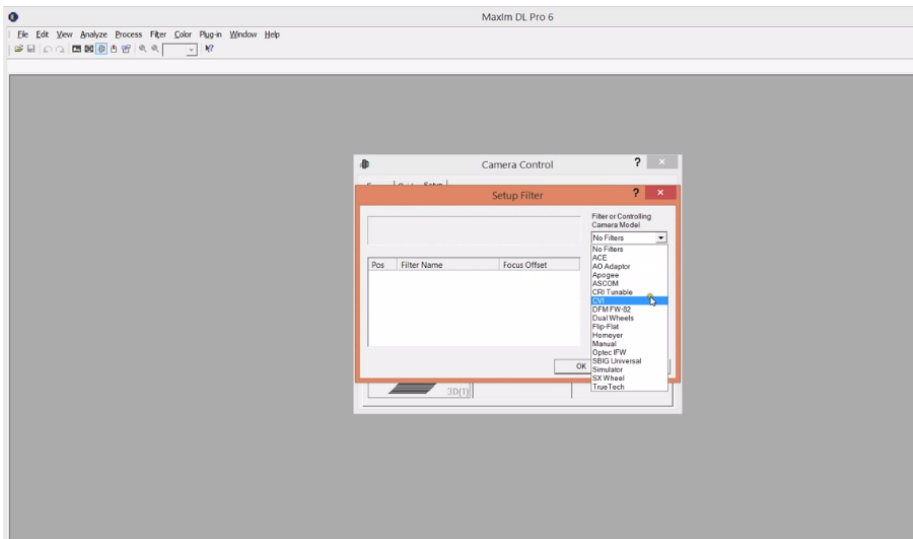
gdy kamery brak można użyć opcji Simulator do nauki programu



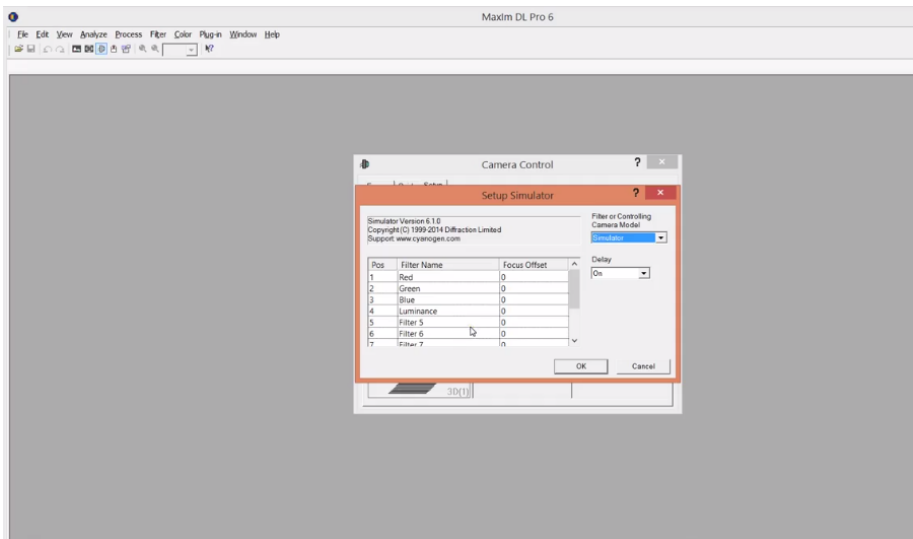
## wyberamy koło filtrów Setup Filter



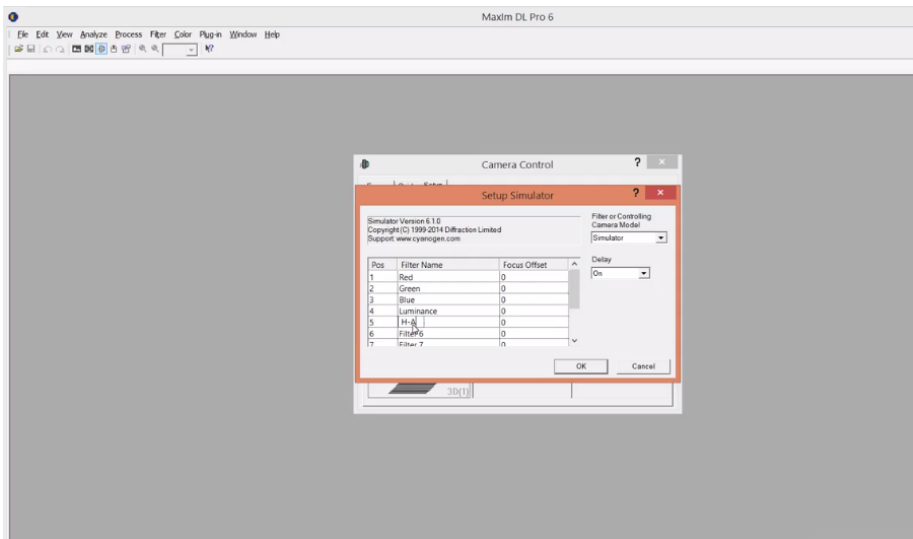
## jeśli brak to wybieramy Simulator



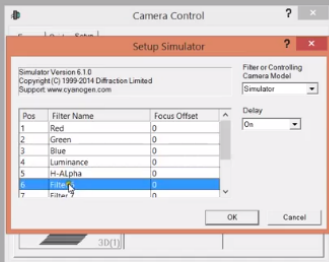
ustawiamy przystępne nazwy dla odpowiedniej pozycji koła filtrów

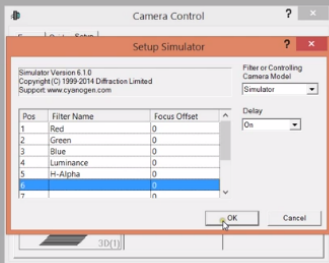


nazwy można modyfikować i usuwać

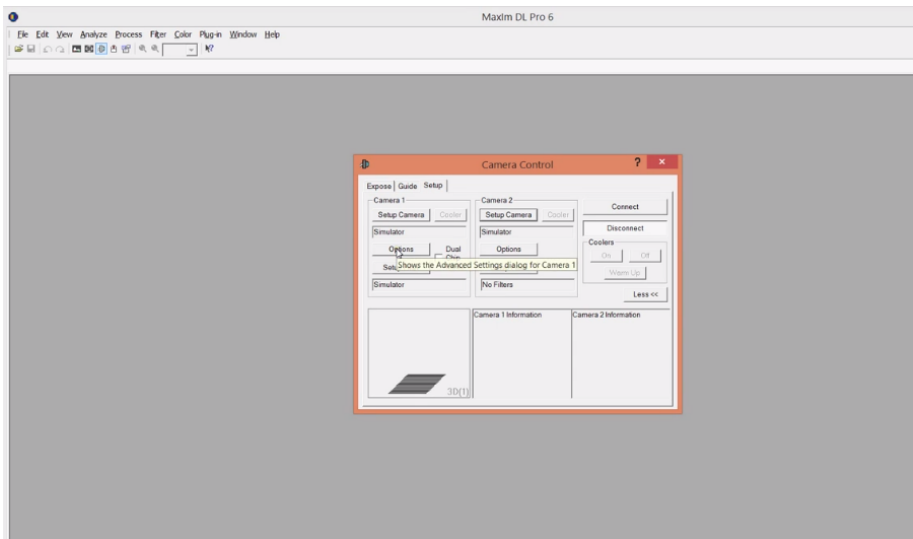




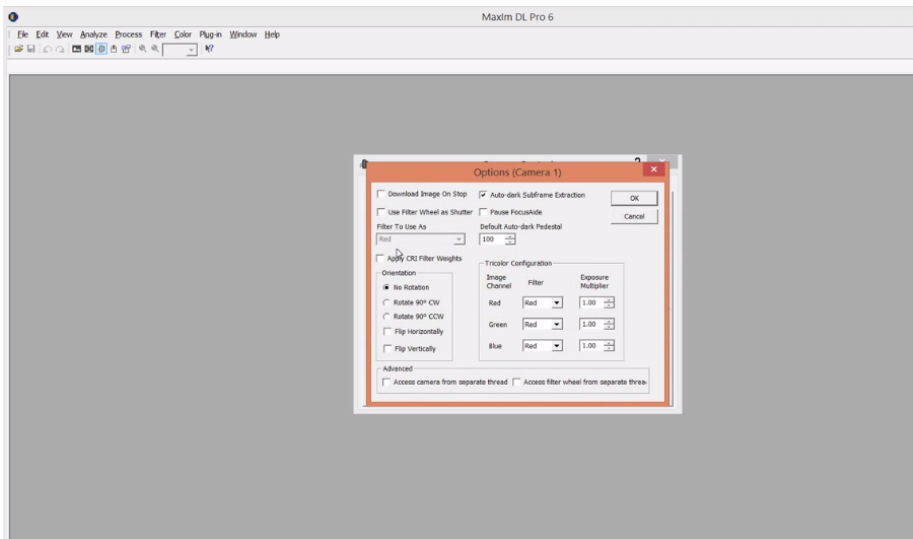




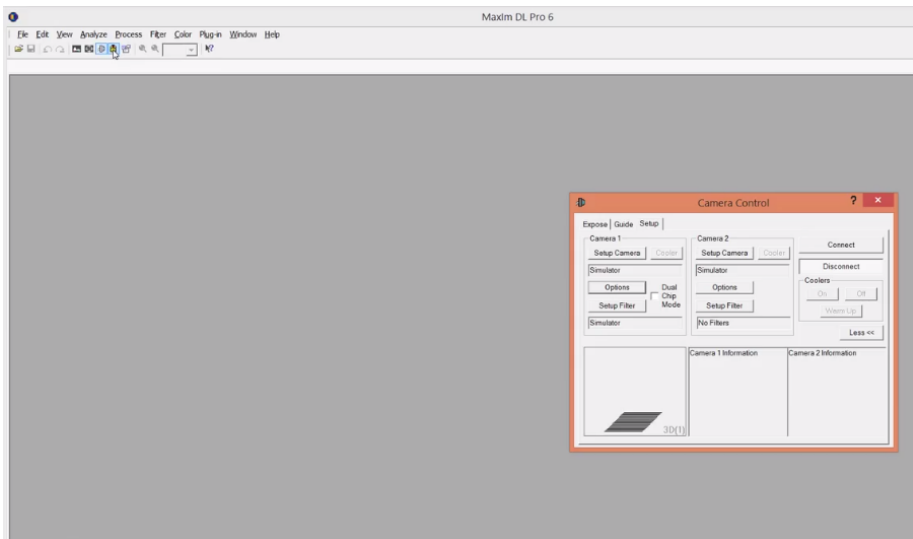
## ustawiamy dodatkowe opcje kamery



## Download Image On Stop przy długich ekspozycjach



## wybór i konfiguracja teleskopu



File Edit View Analyze Process Filter Color Plug-in Window Help

**Observatory** ? x

Catalog | Telescope | Dome | Focus | Status | Weather | Webcam | Setup | < | >


Options ▶

Telescope	▶ Connect	Disconnect	• No Device Selected
Focuser 1	▶ Connect	Disconnect	• No Device Selected
Focuser 2	▶ Connect	Disconnect	• No Device Selected
Dome	▶ Connect	Disconnect	• No Device Selected
Retractor	▶ Connect	Disconnect	• No Device Selected
Webcam	▶ Connect	Disconnect	• USB2.0 HD UVC Web-Cam
Switch	▶ Connect	Disconnect	• No Device Selected
Bothwood CS	▶ Connect	Disconnect	• Unavailable
Davis WS	▶ Connect	Disconnect	• Not Connected

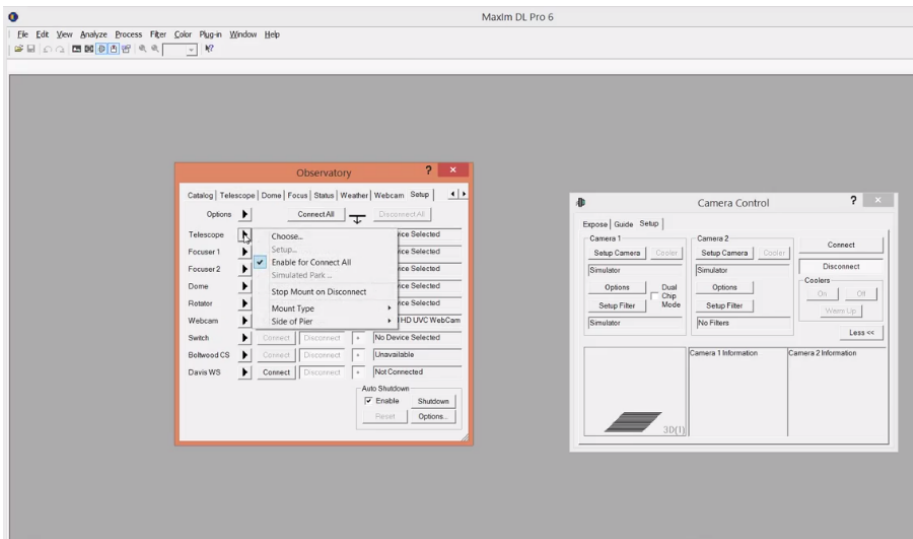
Auto Shutdown  
 Enable

**Camera Control** ? x

Expose | Guide | Setup

<p>Camera 1</p> <input type="button" value="Setup Camera"/> <input type="button" value="Cooler"/> <p>Simulator</p> <input type="button" value="Options"/> <input type="button" value="Dual Chip Mode"/> <p>Setup Filter</p> <p>Simulator</p>	<p>Camera 2</p> <input type="button" value="Setup Camera"/> <input type="button" value="Cooler"/> <p>Simulator</p> <input type="button" value="Options"/> <p>Setup Filter</p> <p>No Filters</p>	<input type="button" value="Connect"/> <input type="button" value="Disconnect"/> Coolers <input type="button" value="On"/> <input type="button" value="Off"/> <input type="button" value="Warm Up"/> <input type="button" value="Less &lt;&lt;"/>
		<p>Camera 1 Information</p> <p>Camera 2 Information</p>

# Choose



Observatory ? x

Catalog Telescope Dome Focus Status Weather Webcam Setup

Options Connect All Disconnect

Telescope	Connect	Disconnect	No D
Focuser 1	Connect	Disconnect	No D
Focuser 2	Connect	Disconnect	No D
Dome	Connect	Disconnect	No D
Rotator	Connect	Disconnect	No D
Webcam	Connect	Disconnect	USB2
Switch	Connect	Disconnect	No D
Bolwood CS	Connect	Disconnect	Unav
Davis WS	Connect	Disconnect	Not Connected

Auto Shutdown  
 Enable Shutdown  
Reset Options...

ASCOM Telescope Chooser

Trace  
Select the type of telescope you have, then be sure to click the Properties... button to configure the driver for your telescope.

- ACP Telescope Hub (ASCOM)
- ASCOM Dome Control
- ASCOM Vixen Telescope Hub
- FocusMax Telescope Hub
- Generic Hub
- Pipe diagnostic tool
- POTH Hub
- Simulator

Properties...  
OK  
Cancel

Camera Control ? x

Camera 2  
Setup Camera Cooler Connect  
Disconnect  
Coolers On Off  
Warm Up

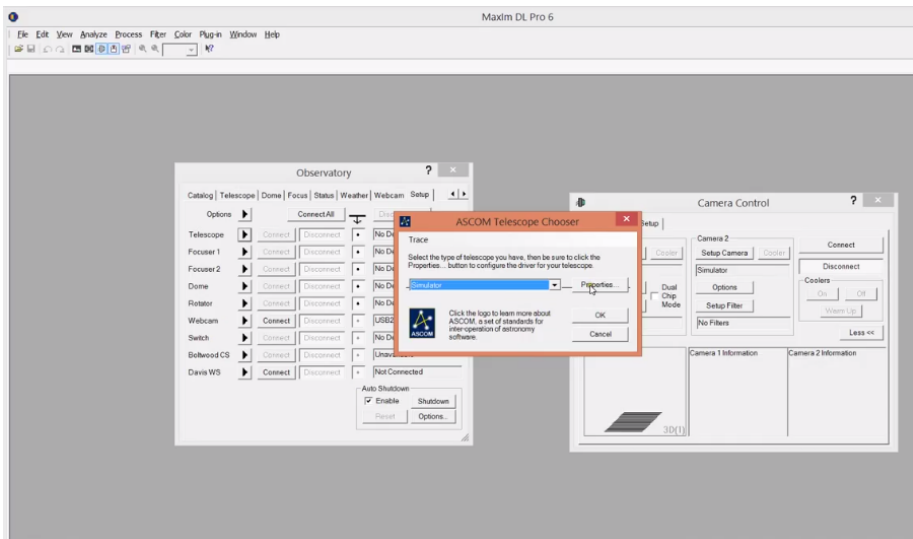
Options  
Setup Filter  
No Filters  
Less <<

Camera 1 Information  
Camera 2 Information

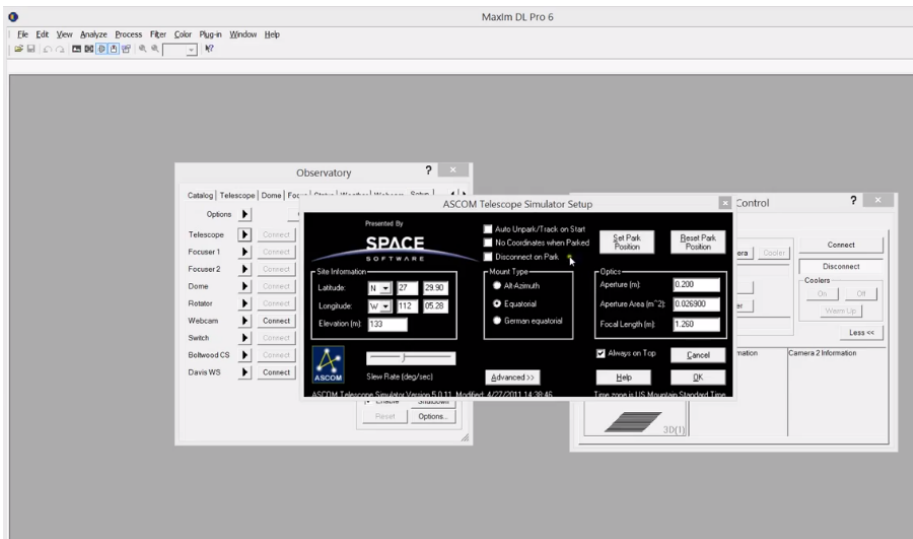
30(1)



## dostępna jest opcja Simulator, klikając na Properties



pokazuje się okno dialogowe do obsługi teleskopu



# podłączenie teleskopu

MaxIm DL Pro 6

File Edit View Analyze Process Filter Color Plug-in Window Help

30(1)

### Observatory

Catalog | Telescope | Dome | Focus | Status | Weather | Webcam | Setup

Options | Connect All | Disconnect All

Component	Connect	Disconnect	Status
Telescope	Connect	Disconnect	• Simulator
Focuser 1	Connect	Disconnect	• No Device Selected
Focuser 2	Connect	Disconnect	• No Device Selected
Dome	Connect	Disconnect	• No Device Selected
Rotator	Connect	Disconnect	• No Device Selected
Webcam	Connect	Disconnect	• USB2.0 HD UVC Web-Cam
Switch	Connect	Disconnect	• No Device Selected
Bothwood CS	Connect	Disconnect	• Unavailable
Davis WS	Connect	Disconnect	• Not Connected

Auto Shutdown

Enable    Shutdown

Reset    Options...

### Camera Control

Expose | Guide | Setup

Camera 1	Camera 2	Control
Setup Camera    Cooler	Setup Camera    Cooler	Connect
Simulator	Simulator	Disconnect
Options    Dual Chip Mode	Options	Coolers
Setup Filter	Setup Filter	On    Off
Simulator	No Filters	Warm Up
		Less <<
Camera 1 Information	Camera 2 Information	

30(1)

## aktywuje się zakładka Telescope do sterowania teleskopem

MaxIm DL Pro 6

File Edit View Analyze Process Filter Color Plug-in Window Help

Observatory

Catalog Telescope Dome Focus Status Weather Webcam Setup

Connected, Not Focused  
RA 17h 57m 49s, Dec +00° 00' 20" (JNow)  
RA 17h 57m 04s, Dec +00° 00' 23" (J2000)  
Alt Unknown, Az Unknown  
Idle

Abort

Nudge

NE N NW  
E W  
SE S SW

10 Sec

Mount

Park  
Unpark  
 Sidereal Tracking

Target Coordinates

RA [ ] Go To  
Dec [ ] Sync  
Roll Angle [ ] On  JNow  J2000

Center on Image  
Select Center (or use Image right-click menu) Calibrate

Use Scope Pier Flip  Pier Flip  Minor

Configuration

Site and Optics  
Limits and Flip

Auto Exposure

Expose After Slew  
Setup Auto Exposure

Camera Control

Expose Guide Setup

Camera 1  
Setup Camera Cooler  
Simulator  
Options Dual Chip Mode  
Setup Filter  
Simulator

Camera 2  
Setup Camera Cooler  
Simulator  
Options  
Setup Filter  
No Filters

Connect  
Disconnect  
Coolers On Off  
Warm Up  
Less <<

Camera 1 Information  
Camera 2 Information

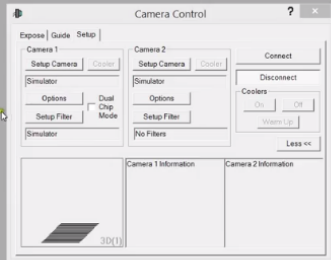
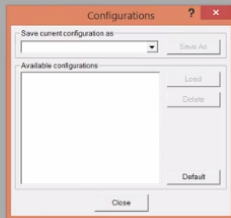
30(1)

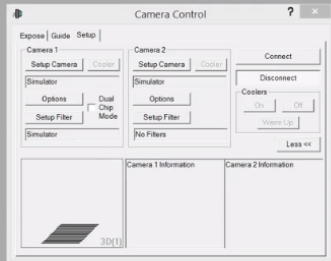
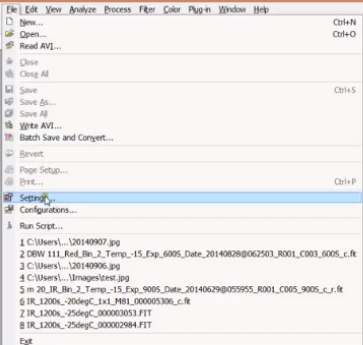
Navigation icons: back, forward, search, etc.

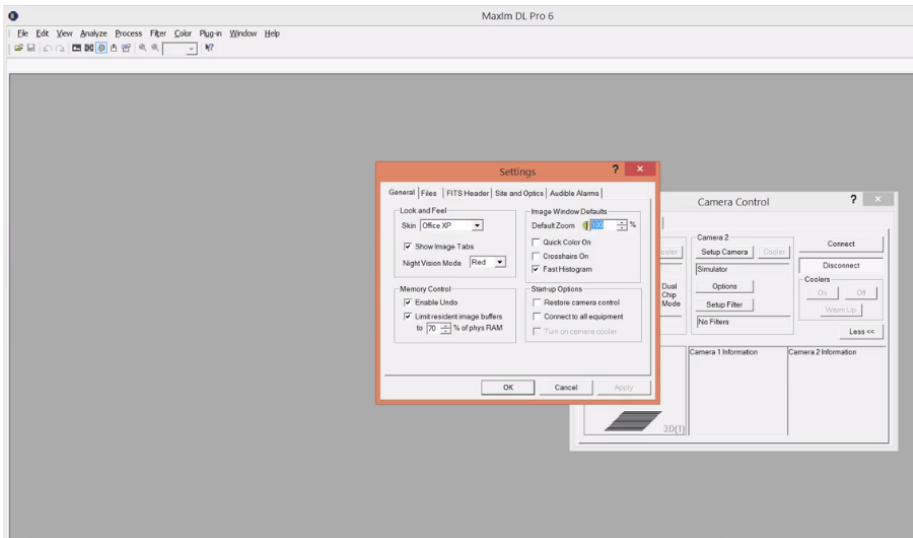
bieżącą konfigurację można zapisać i załadować w razie potrzeby z pliku konfiguracyjnego

The screenshot displays the MaxIm DL Pro 6 software interface. The main window title is "MaxIm DL Pro 6". The "File" menu is open, showing options such as "New...", "Open...", "Read AVI...", "Close", "Close All", "Save", "Save As...", "Write AVI...", "Batch Save and Convert...", "Revert", "Page Setup...", "Print...", "Settings...", "Configure...", and "Run Script...". The "Configure..." option is highlighted. Below the menu, a list of files is visible, including "1 C:\Users\...\120140907.jpg", "2 DBW 111\_Red\_Bri\_2\_Temp\_-15\_Exp\_6005\_Date\_20140828@062503\_R001\_C003\_6005\_c.ft", "3 C:\Users\...\120140906.jpg", "4 C:\Users\...\Images\test.jpg", "5 m 20\_IR\_Bri\_2\_Temp\_-15\_Exp\_9005\_Date\_20140629@055955\_R001\_C005\_9005\_c\_r.ft", "6 IR\_1200x\_-20degC\_1x1\_M81\_000005306\_c.ft", "7 IR\_1200x\_-25degC\_000003053.FIT", and "8 IR\_1200x\_-25degC\_000002984.FIT".

The "Camera Control" dialog box is open, showing settings for two cameras. The "Expose | Guide | Setup" tabs are visible. The "Camera 1" and "Camera 2" sections each have "Setup Camera" and "Cooler" buttons. The "Camera 1" section also has "Options", "Setup Filter", and "Simulator" buttons. The "Camera 2" section has "Options", "Setup Filter", and "No Filters" buttons. The "Cooler" section has "Connect", "Disconnect", "On", "Off", "Warm Up", and "Less <<" buttons. The "Camera 1 Information" and "Camera 2 Information" sections are empty. A small image of a camera sensor is visible in the bottom left corner of the dialog.

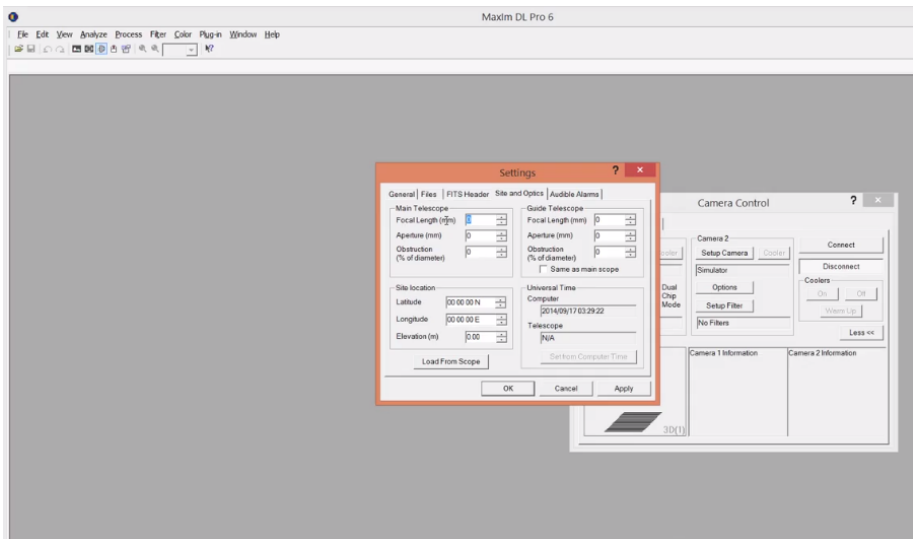








## ustawienia miejsca obserwacji i cech teleskopu



## ustawienia własnych słów kluczowych w nagłówku plików FITS

The screenshot displays the MaxIm DL Pro 6 interface. The main window title is "MaxIm DL Pro 6". The menu bar includes "File", "Edit", "View", "Analyze", "Process", "Filter", "Color", "Plug-in", "Window", and "Help". The toolbar contains various icons for file operations and processing.

In the foreground, the "Settings" dialog box is open, with the "FITS Header" tab selected. The dialog has a table for defining keywords:

Keyword	Value
OBJECT	(Automatic)
TELESCOP	
INSTRUME	
OBSERVER	
NOTES	

Below the table, there are input fields for "Key" and "Value", and a "Type" dropdown menu set to "Integer". There are "Set" and "Clear" buttons next to these fields. At the bottom of the dialog, there are two checkboxes:

- Set INSTRUME from camera plug-in (recommended)
- Use RAF convention for IMAGETYP values

Buttons for "OK", "Cancel", and "Apply" are at the bottom of the dialog.

In the background, the "Camera Control" dialog box is partially visible, showing sections for "Camera 2" (with "Setup Camera" and "Cooler" buttons), "Simulator" (with "Options" and "Setup Filter" buttons), "No Filters", "Connect", "Disconnect", "Coolers" (with "On" and "Off" buttons and a "Warm Up" button), and "Less <<" button. There are also sections for "Camera 1 Information" and "Camera 2 Information".

## dodajemy słowo kluczowe Telescope

The screenshot shows the MaxIm DL Pro 6 interface. The main window title is "MaxIm DL Pro 6". The menu bar includes "File", "Edit", "View", "Analyze", "Process", "Filter", "Color", "Plug-in", "Window", and "Help". The toolbar contains various icons for file operations and processing.

In the foreground, the "Settings" dialog box is open, with the "Site and Optics" tab selected. The dialog has a table for keywords:

Keyword	Value
OBJECT	(Automatic)
TELESCOP	
INSTRUME	
OBSERVER	
NOTES	

Below the table, the "Key" is set to "TELESCOP" and the "Type" is "String". There are "Set" and "Unset" buttons next to these fields. The "Value" field is empty. At the bottom of the dialog, there are two checkboxes:  "Set INSTRUME from camera plug-in (recommended)" and  "Use RAF convention for IMAGETYP values". The "OK", "Cancel", and "Apply" buttons are at the bottom.

In the background, the "Camera Control" dialog box is partially visible, showing sections for "Camera 2" (Setup Camera, Cooler, Connect, Disconnect, Coolers, Setup Filter, No Filters) and "Camera 1 Information" / "Camera 2 Information".

## dodajemy słowo kluczowe Observer

The screenshot shows the MaxIm DL Pro 6 interface. The main window is titled "MaxIm DL Pro 6" and has a menu bar with "File", "Edit", "View", "Analyze", "Process", "Filter", "Color", "Plug-in", "Window", and "Help". Below the menu bar is a toolbar with various icons. The main workspace is currently empty and greyed out.

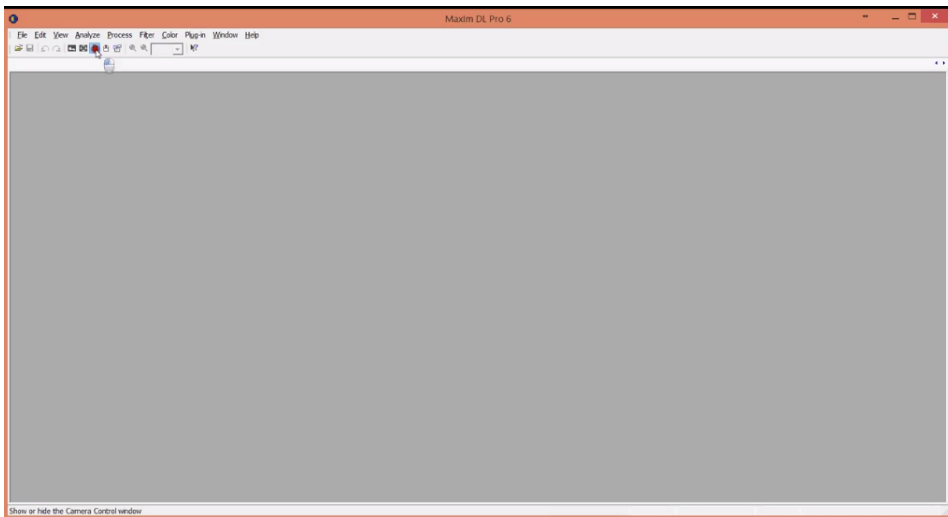
In the foreground, a "Settings" dialog box is open, with the "General" tab selected. The dialog box has a title bar with a question mark and a close button. The "General" tab contains a table of keywords:

Keyword	Value
OBJECT	(Automatic)
TELESCOP	GSO 10 inch RC
INSTRUME	QSI
OBSERVER	
NOTES	

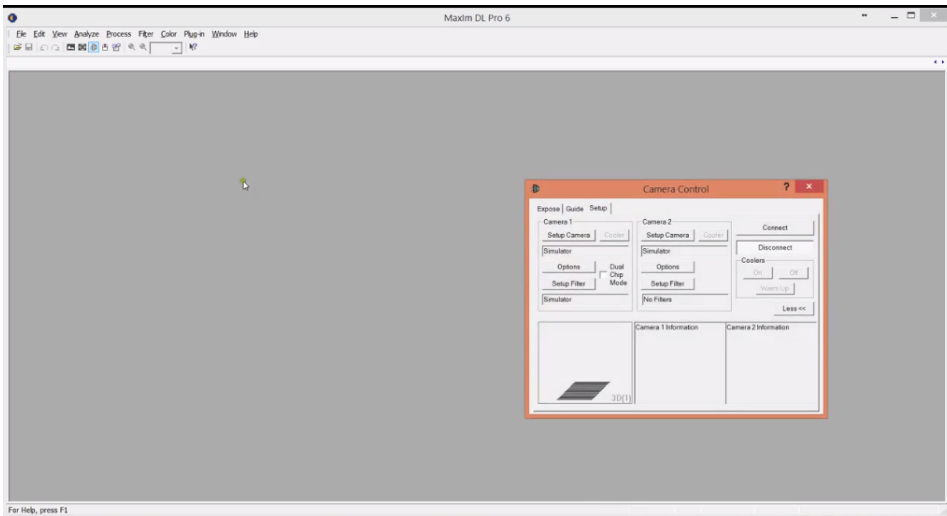
Below the table, there are fields for "Key" and "Value". The "Key" dropdown is set to "OBSERVER" and the "Type" dropdown is set to "String". The "Value" field is empty. There are "Set" and "Clear" buttons next to these fields. At the bottom of the dialog, there are two checkboxes: "Set INSTRUME from camera plug-in (recommended)" (checked) and "Use RAF convention for IMAGETYP values" (unchecked). The "OK", "Cancel", and "Apply" buttons are at the bottom.

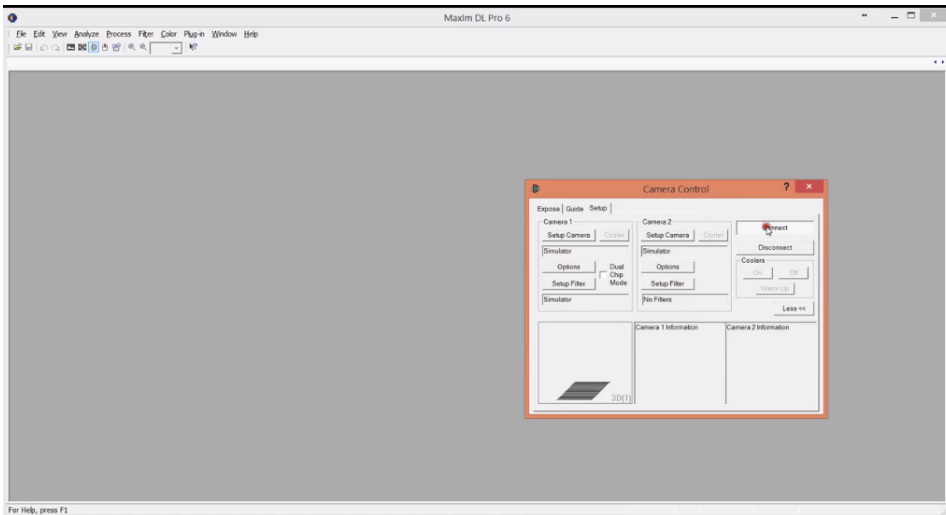
In the background, the "Camera Control" dialog box is partially visible. It has a title bar with a question mark and a close button. The "Camera 2" section is active, showing "Setup Camera" and "Cooler" buttons. There are also "Connect" and "Disconnect" buttons, and "On" and "Off" buttons for "Coolers". The "Camera 1 Information" and "Camera 2 Information" sections are empty.

wracamy do kamery aby ją włączyć i użyć



## otwiera się okno kontroli pracy kamery





## włączamy chłodzenie kamery lub kamer

The screenshot displays the Maxim DL Pro 6 software interface. The main window title is "Maxim DL Pro 6". The menu bar includes "File", "Edit", "View", "Analyze", "Process", "Filter", "Color", "Plug-in", "Window", and "Help". The toolbar contains various icons for file operations and processing. A "Camera Control" dialog box is open, featuring tabs for "Expose", "Guide", and "Setup".

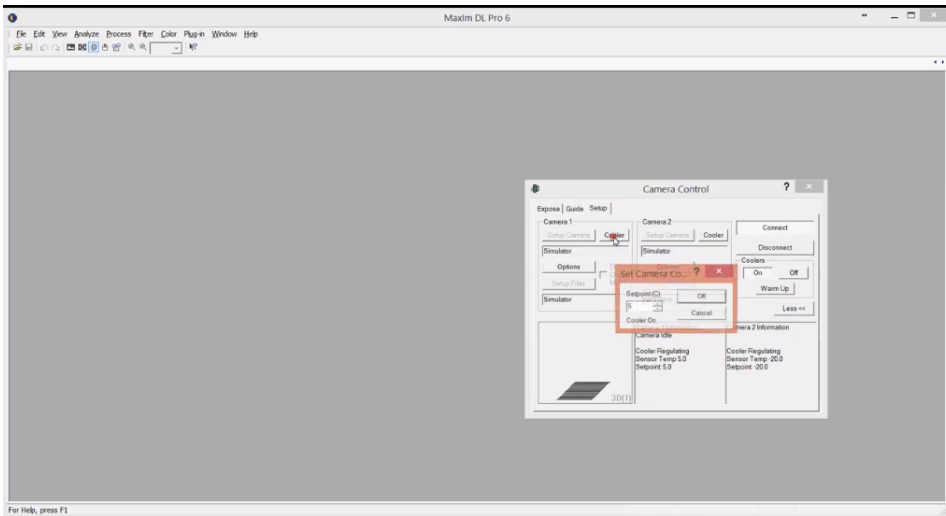
The "Camera Control" dialog box is divided into several sections:

- Camera 1:** Includes "Setup Camera" and "Cooler" buttons, a "Simulator" button, "Options" and "Dust Crop Mode" checkboxes, "Setup Filter" and "Simulator" buttons.
- Camera 2:** Includes "Setup Camera" and "Cooler" buttons, a "Simulator" button, "Options" and "Setup Filter" buttons, and a "No Filters" button.
- Connect/Disconnect:** Includes "Connect" and "Disconnect" buttons, a "Coolers" section with a "Off" button and a "Turn Up" button, and a "Less <<" button.
- Information:** Two panels for "Camera 1 Information" and "Camera 2 Information", both showing "Camera Idle" and "Cooler is off".
- 3D View:** A small 3D view of a camera sensor array labeled "3D(1)".

At the bottom left of the main window, it says "For Help, press F1". At the bottom right, there are navigation icons for back, forward, and search.



## ustawiamy temperaturę pracy kamery



The screenshot displays the Maxim DL Pro 6 software interface. The main window title is "Maxim DL Pro 6". The menu bar includes "File", "Edit", "View", "Analyze", "Process", "Filter", "Color", "Plug-in", "Window", and "Help". The toolbar contains various icons for file operations and analysis. The main workspace is a large gray area.

In the foreground, the "Camera Control" dialog box is open, featuring tabs for "Expose", "Guide", and "Setup". The "Setup" tab is active, showing controls for two cameras:

- Camera 1:** Includes buttons for "Setup Camera", "Cooler", "Simulator", "Options", "Setup Filter", and "Simulator".
- Camera 2:** Includes buttons for "Setup Camera", "Cooler", and "Simulator".

A sub-dialog box titled "Set Camera Co..." is open over the "Cooler" button of Camera 1. It contains a "Setpoint" field with a value of "5", "OK", "Cancel", and "Cooler On" buttons.

On the right side of the "Camera Control" dialog, there are "Connect" and "Disconnect" buttons, a "Coolers" section with "On" and "Off" radio buttons, a "Warm Up" button, and a "Less <<" button. Below these are "Camera 1 Information" and "Camera 2 Information" sections, each showing "Cooler Regulating" status and "Sensor Temp" and "Setpoint" values.

At the bottom left of the main window, the text "For Help, press F1" is visible.

Camera Control

Expose | Guide | Setup


Camera 1 Setup Camera Cooler Simulator Options Setup Filter Simulator	Camera 2 Setup Camera Cooler Simulator	Connect Disconnect Coolers On Off Warm Up Less <<
---	---	--

Set Camera Co... ? x

Setpoint (C)  OK  
Cooler On  Call

Camera 1 Information  
Cooler Regulating  
Sensor Temp 5.0  
Setpoint 5.0

Camera 2 Information  
Cooler Regulating  
Sensor Temp 20.0  
Setpoint 20.0



## wybieramy zakładkę Expose

The screenshot displays the Maxim DL Pro 6 software interface. The main window has a menu bar with 'File', 'Edit', 'View', 'Analyze', 'Process', 'Filter', 'Color', 'Plug-in', 'Window', and 'Help'. Below the menu bar is a toolbar with various icons. The main workspace is a large gray area. A 'Camera Control' dialog box is open in the foreground, featuring a tabbed interface with 'Expose', 'Guide', and 'Setup' tabs. The 'Expose' tab is active, showing settings for two cameras. Camera 1 settings include 'Setup Camera', 'Cooler', 'Simulator', 'Options', 'Dust Crp. Mode', 'Setup Filter', and another 'Simulator' button. Camera 2 settings include 'Setup Camera', 'Cooler', 'Simulator', 'Options', 'Setup Filter', and 'No Filters'. A 'Connect' section on the right has 'Connect', 'Disconnect', 'Coolers' (On/Off), and 'Warm Up' buttons, along with a 'Less <<' button. Information panels at the bottom show 'Camera 1 Information' (Camera Idle, Cooler Regulating, Sensor Temp: 5.0, Setpoint: 5.0) and 'Camera 2 Information' (Cooler Regulating, Sensor Temp: 20.0, Setpoint: 20.0). A small 3D model of a camera sensor is visible in the bottom left of the dialog. At the bottom of the main window, it says 'For Help, press F1'. At the very bottom of the image, there are navigation icons for a presentation slide.

## wybieramy właściwą kamerę

Maxim DL Pro 6

File Edit View Analyze Process Filter Color Plug-in Window Help

Camera Control

Expose | Guide | Setup

Exposure Priority: Find Star

Readout Mode: Normal

Speed: ISO

Frame Type: Single

Filter Wheel: Lumance

Seconds: 0

Subframe: On

X Binning: 1

Y Binning: Same

Camera: Camera 1

Start

Stop

Single

Continuous

Autosave

Options

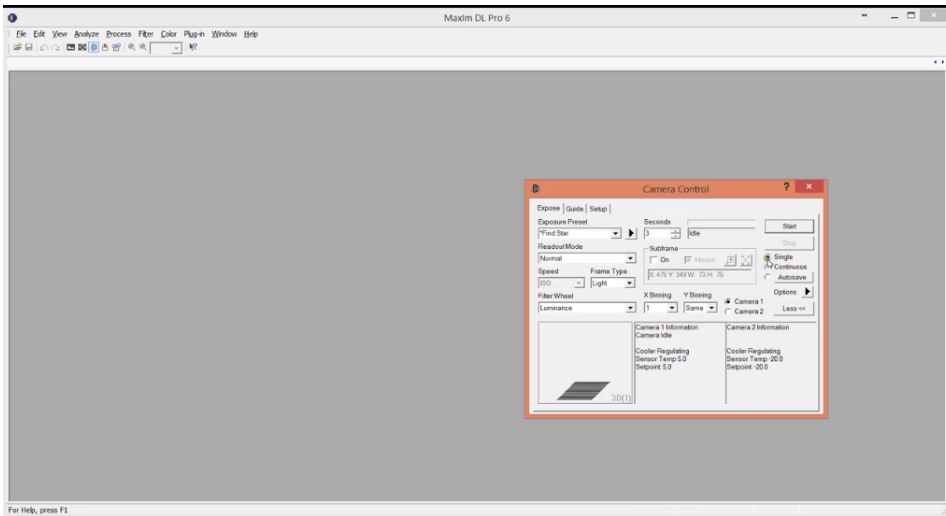
Camera 1 Information  
Camera Idle  
Cooler Regulating  
Sensor Temp: 5.0  
Setpoint: 5.0

Camera 2 Information  
Camera Idle  
Cooler Regulating  
Sensor Temp: 20.0  
Setpoint: 20.0

3D(1)

For Help, press F1

wybieramy na początek opcję ekspozycji typu Single i Find Star



### Camera Control

Expose | Guide | Setup |

Exposure Preset  
Wide Open

Fixed Star  
Fixed DBO  
Focus  
Focus Guider  
LRGB  
[RGB] | Light

Filter Wheel  
Luminance

Seconds  
3

Idle

Start

Stop

Subframe  
On Mouse

X: 475 Y: 340 W: 73 H: 76

X Binning Y Binning  
1 Same

Camera 1  
Camera 2

Options  
Less <<

Single  
Continuous  
Autosave

Camera 1 Information  
Camera Idle  
Cooler Regulating  
Sensor Temp: 5.0  
Setpoint: 5.0

Camera 2 Information  
Cooler Regulating  
Sensor Temp: 20.0  
Setpoint: 20.0

### Camera Control

Expose | Guide | Setup |

Exposure Preset  
New-Start  
New-Start  
New-Start

Seconds  
5  
Idle

Start

Stop

Subframe  
On Mouse

Single  
Continuous  
Autosave

Options  
Less <<


Focus Guider  
LROB  
Light

Fiber Wheel  
Luminance

X Binning Y Binning  
1 Same  
Camera 1  
Camera 2

Camera 1 Information  
Camera Idle  
Cooler Regulating  
Sensor Temp: 5.0  
Setpoint: 5.0

Camera 2 Information  
Cooler Regulating  
Sensor Temp: 20.0  
Setpoint: 20.0



ustawiamy czas ekspozycji, filtr, binowanie dla jednej ekspozycji

The screenshot displays the Maxim DL Pro 6 software interface. The main window is titled "Maxim DL Pro 6" and features a menu bar with "File", "Edit", "View", "Analyze", "Process", "Filter", "Color", "Plug-in", "Window", and "Help". Below the menu bar is a toolbar with various icons. The main workspace is a large gray area. In the bottom right corner, a "Camera Control" dialog box is open, highlighted with an orange border. The dialog box has tabs for "Expose", "Guide", and "Setup". Under the "Expose" tab, there are several controls: "Exposure Preset" (Find Site), "Readout Mode" (Normal), "Speed" (100), "Filter Wheel" (Lumance), "Seconds" (1), "Subframe" (On), "X Binning" (3), "Y Binning" (Same), and "Camera" (Camera 1). There are also "Start" and "Stop" buttons. At the bottom of the dialog, there are sections for "Camera 1 Information" and "Camera 2 Information", both showing "Cooler Regulating Sensor Temp" and "Setpoint 5.0".

Maxim DL Pro 6

File Edit View Analyze Process Filter Color Plug-in Window Help

Camera Control

Expose | Guide | Setup

Exposure Preset  
Find Site

Readout Mode  
Normal

Speed  
100

Filter Wheel  
Lumance

Seconds  
1

Subframe  
 On  Mouse

X Binning  
3

Y Binning  
Same

Camera  
Camera 1

Start

Stop

Single  
Continuous  
Autosave

Options  
Less <<

Camera 1 Information  
Cooler Regulating  
Sensor Temp: 5.0  
Setpoint: 5.0

Camera 2 Information  
Cooler Regulating  
Sensor Temp: 20.0  
Setpoint: 20.0

3D(1)

For Help, press F1



### Camera Control

Expose | Guide | Setup | ? x

Exposure Preset: Find Star | Seconds: 1 | Mode: Idle | Start | Stop

Readout Mode: Normal | Subframe: On | On Mouse | Off | On | Off

Speed: 100 | Frame Type: Light | X Binning: 0 V, 0 W, 192 H, 127

Filter Wheel: Luminance | X Binning: 4 | Y Binning: Gamma | Camera 1 | Camera 2

Options: Single | Continuous | Autosave | Options | Less <<

Camera 1 Information	Camera 2 Information
Camera Idle	Camera Idle
Cooler Regulating Sensor Temp: 5.0 Setpoint: 5.0	Cooler Regulating Sensor Temp: 20.0 Setpoint: 20.0

- No Calibration
- Simple Auto-dark
- Full Calibration
- Reset Auto-dark
- Reset All Auto-dark
- Display Large Statistics
- Reset Exposure
- Exposure Excessive
- Exposure Active
- Set Image Save Path...
- Auto-Subfolder
- New Subfolder at
- Auto Save All Exposures
- Camera Settings...
- Exposure Delay...
- Auto-Tricolor
- New Buffer (Single Only)
- Screen During Exposures
- Expose Auto Script
- Auto Script Settings...
- Measure Shutter Latency...
- Show Tool Tips

## rozwijamy dodatkowe opcje

The screenshot shows the MaxIm DL Pro 6 software interface. The main window title is "Maxim DL Pro 6". The menu bar includes "File", "Edit", "View", "Analyze", "Process", "Filter", "Color", "Plug-in", "Window", and "Help". The toolbar contains various icons for file operations and camera control.

The "Camera Control" dialog box is open, showing the following settings:

- Expose | Guide | Setup |
- Exposure Preset: Find Star
- Readout Mode: Normal
- Speed: 100
- Filter Wheel: Luminance
- Seconds: 1
- Subframe: On
- X Binning: 4
- Y Binning: Gamma
- Camera 1 Information: Camera Idle
- Camera 2 Information: Camera Idle

The context menu for the "Options" button in the Camera Control dialog is open, listing the following options:

- No Calibration
- Simple Auto-dark
- Full Calibration
- Reset Auto-dark
- Reset All Auto-dark
- Display Large Statistics
- Pause Exposure
- Resume Exposure
- Resume Autosave
- Set Image Save Path...
- Auto-Subfolder
- New Subfolder at
- Auto Save All Exposures
- Camera Settings...
- Exposure Delay...
- Auto-Tricolor
- New Buffer (Single Only)
- Screen During Exposures
- Expose Auto Script
- Auto Script Settings...
- Measure Shutter Latency...
- Show Tool Tips

At the bottom left of the main window, it says "For Help, press F1". At the bottom right, there are navigation icons for back, forward, and search.

## odświeżamy ustawienia

The screenshot displays the Maxim DL Pro 6 software interface. The main window title is "Maxim DL Pro 6". The menu bar includes "File", "Edit", "View", "Analyze", "Process", "Filter", "Color", "Plug-in", "Window", and "Help". The toolbar contains various icons for file operations and camera control. The main workspace is a large gray area. A "Camera Control" dialog box is open, showing the following settings:

- Expose | Guide | Setup |
- Exposure Preset: Find Star
- Readout Mode: Normal
- Speed: 100
- Frame Type: Light
- Filter Wheel: Luminance
- Shutter: 4
- Gain: 0
- Camera: Camera 1
- Buttons: Start, Stop, Single, Continuous, Autocore, Options, Less <<
- Context Menu: Update Current Preset, Rename Preset, Save As New Preset..., Delete Preset, Sort Presets...
- Camera 1 Information: Camera Idle, Cooler Regulating, Sensor Temp: 5.0, Setpoint: 5.0
- Camera 2 Information: Camera Idle, Cooler Regulating, Sensor Temp: 20.0, Setpoint: 20.0
- Thumbnail: 3D(1)

For Help, press F1

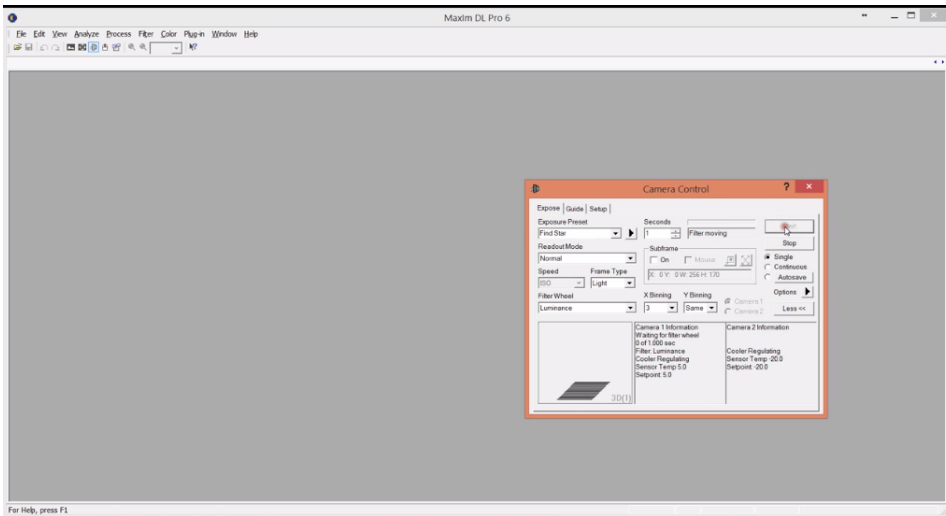
klikamy Start aby wykonać ekspozycję

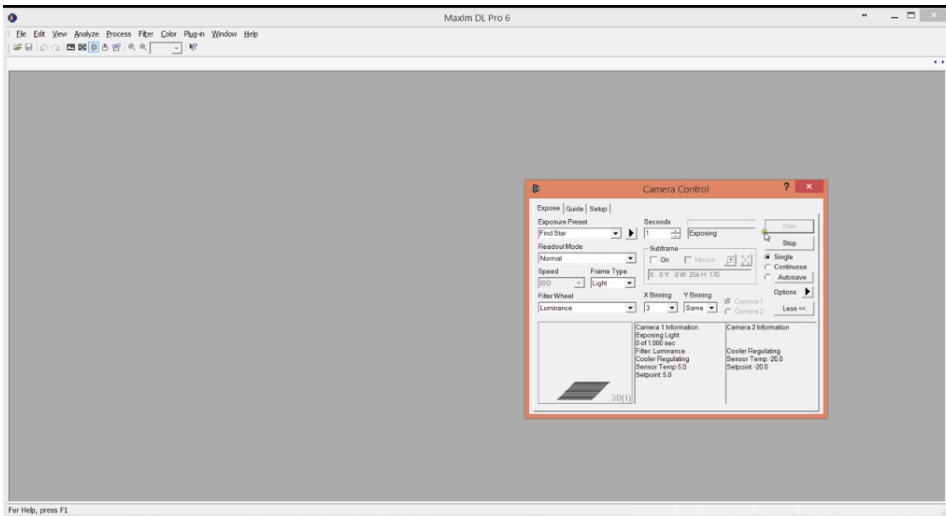
The screenshot displays the Maxim DL Pro 6 software interface. The main window title is "Maxim DL Pro 6". The menu bar includes: File, Edit, View, Analyze, Process, Filter, Color, Plug-in, Window, Help. The toolbar contains icons for file operations and camera control. The main workspace is a large grey area. A "Camera Control" dialog box is open in the foreground, featuring the following controls:

- Expose | Guide | Setup |
- Exposure Preset: Find Site (dropdown)
- Readout Mode: Normal (dropdown)
- Speed: 100 (dropdown)
- Frame Type: Light (dropdown)
- Filter Wheel: Luminance (dropdown)
- Seconds: 1 (input field)
- Subframe: On (checkbox), 14000 (input field)
- Resolution: X: 0 V: 0 W: 256 H: 170
- X Binning: 3 (dropdown)
- Y Binning: Same (dropdown)
- Camera Selection: Camera 1 (radio button)
- Buttons: Start (red), Stop (blue), Single (radio), Continuous (radio), Autosave (radio), Options (arrow), Less <<
- Camera 1 Information: Camera Idle, Cooler Regulating, Sensor Temp: 5.0, Setpoint: 5.0
- Camera 2 Information: Cooler Regulating, Sensor Temp: 20.0, Setpoint: 20.0
- Thumbnail: 3D(1)

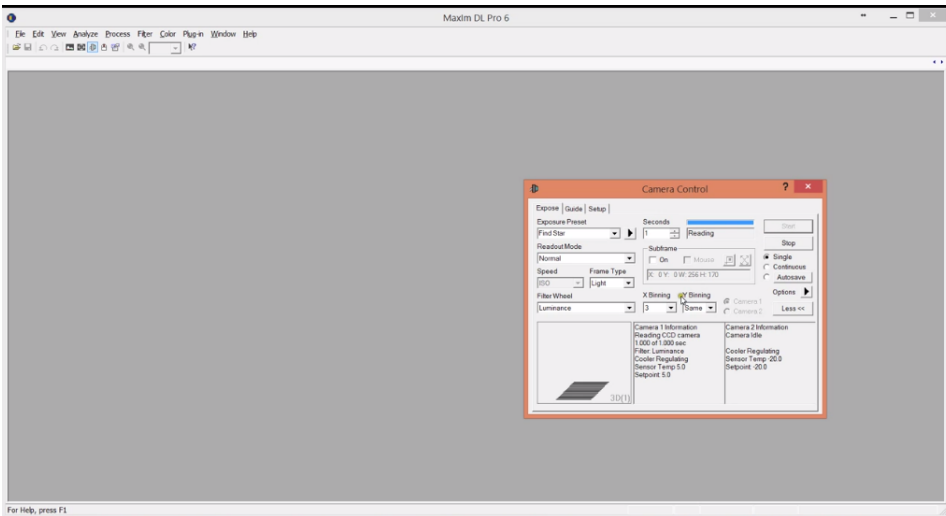
At the bottom left of the main window, it says "For Help, press F1". At the bottom right of the entire image, there are navigation icons: back, forward, home, search, and refresh.

## następuje wybór filtra

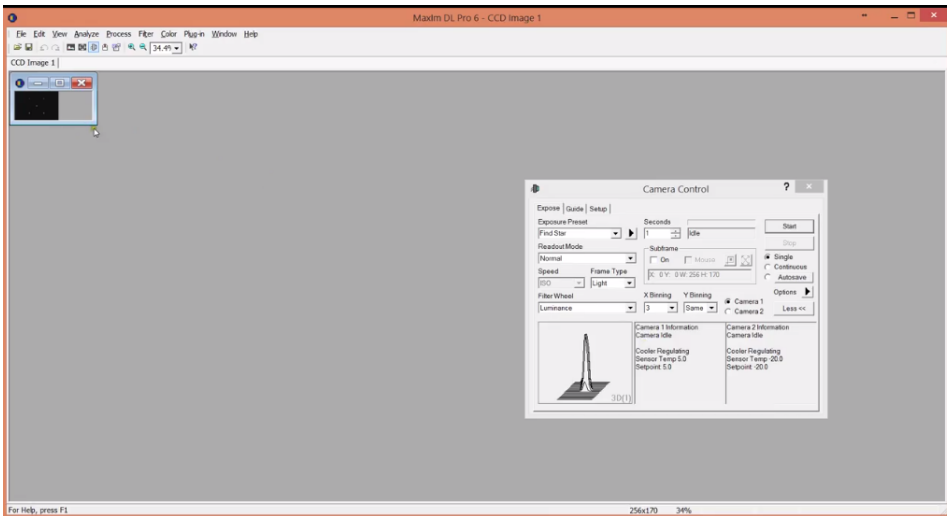




# zczytywanie obrazu

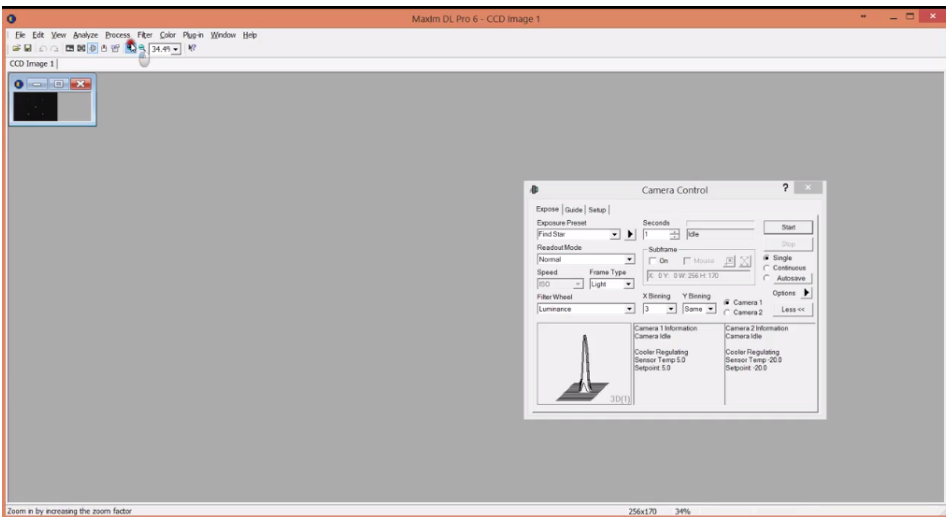


otwiera się nowe okno z obrazem





można powiększyć aby zobaczyć szczegóły



## w przypadku niewystarczającej rozdzielczości rezygnujemy z binowania

The screenshot displays the Maxm DL Pro 6 software interface, titled "Maxm DL Pro 6 - CCD Image 1". The main window shows a dark CCD image with a few bright spots. A "Camera Control" dialog box is open, showing various settings for the camera. The "Exposure Preset" is set to "Find Star", and the "Exposure" is 1 second. The "Readout Mode" is "Normal", and the "Speed" is "Light". The "Filter Wheel" is set to "Luminance". The "X Binning" is 3 and "Y Binning" is "Same". The "Camera 1" and "Camera 2" information sections show "Camera Idle" and "Cooler Regulating" status.

Maxm DL Pro 6 - CCD Image 1

File Edit View Analyze Process Filter Color Plug-in Window Help

CCD Image 1

CCD Imag..

Camera Control

Expose | Guide | Setup |

Exposure Preset: Find Star

Exposure: 1 Seconds

Readout Mode: Normal

Speed: Light

Frame Type: Light

Filter Wheel: Luminance

X Binning: 3 Y Binning: Same

Camera 1 Information: Camera Idle

Camera 2 Information: Camera Idle

Cooler Regulating Sensor Temp: 5.0 Setpoint: 5.0

Cooler Regulating Sensor Temp: 20.0 Setpoint: 20.0

3D(1)

For Help, press F1

256x170 100%

efektem wykonania kolejnej ekspozycji jest obraz o większej rozdzielczości

The screenshot displays the Maxim DL Pro 6 software interface. The main window title is "Maxim DL Pro 6 - CCD Image 1". The menu bar includes "File", "Edit", "View", "Analyze", "Process", "Filter", "Color", "Plug-in", "Window", and "Help". The toolbar shows various icons for file operations and viewing, with a zoom level of 100%. The main workspace shows a dark CCD image with a few bright spots. A "Camera Control" dialog box is open, showing the following settings:

- Expose | Guide | Setup |
- Exposure Preset: Find Star
- Seconds: 2 (0 of 2 sec)
- Readout Mode: Normal
- Speed: 100
- Frame Type: Light
- Filter Wheel: Luminance
- X Binning: 1
- Y Binning: Gamma
- Camera 1 Information: Exposing Light, 0 of 2.000 sec, Filter Luminance, Cooler Regulating, Sensor Temp 5.0, Setpoint 5.0
- Camera 2 Information: Camera Idle, Cooler Regulating, Sensor Temp 20.0, Setpoint 20.0

A histogram is visible in the bottom left of the Camera Control dialog, showing a sharp peak at 30(1). The status bar at the bottom indicates "256x170 100%".

poruszając kursorem po obrazie rejestrujemy zmianę położenia kursora w obrębie mapy pikseli i wartości zliczeń w pikselu

The screenshot displays the MaxIm DL Pro 6 software interface. The main window, titled "Maxim DL Pro 6 - CCD Image 2", shows a dark CCD image with several bright stars. A smaller window titled "CCD Image 2" is also visible, showing a zoomed-in view of the stars. The "Camera Control" panel is open, showing various settings for the camera. The "Exposure Preset" is set to "Find Star", and the "Exposure" is set to 2 seconds. The "Readout Mode" is set to "Normal", and the "Speed" is set to "100". The "Frame Type" is set to "Light". The "Filter Wheel" is set to "Lumance". The "Camera 1 Information" and "Camera 2 Information" sections show "Camera Idle". The "Cooler Regulating Sensor Temp" is 5.0, and the "Setpoint" is 5.0. The "3D(1)" plot shows a single peak. The status bar at the bottom indicates "768x511 100% (727, 115) i 100.000".

Maxim DL Pro 6 - CCD Image 2

File Edit View Analyze Process Filter Color Plug-in Window Help

CCD Image 2

CCD Image 2

Camera Control

Expose | Guide | Setup |

Exposure Preset: Find Star

Seconds: 2

Readout Mode: Normal

Speed: 100

Frame Type: Light

Filter Wheel: Lumance

Subframe: On

X Binning: 1

Y Binning: Same

Camera 1 Information: Camera Idle

Camera 2 Information: Camera Idle

Cooler Regulating Sensor Temp: 5.0

Setpoint: 5.0

3D(1)

Right click for options, or roll mouse wheel to zoom. CTRL or SHIFT for more options.

768x511 100% (727, 115) i 100.000



### Camera Control

Expose | Guide | Setup | ? x

Exposure Preset: Find Star | Seconds: 2 | Mode: Idle | Start | Stop

Readout Mode: Normal | Subframe: On | Off | Mouse | [F1] | [F2]

Speed: [ ] | Frame Type: Light

Filter Wheel: Luminance

X Binning: 1 | Y Binning: Gamma | Camera 1 | Camera 2 | Options | Less <<

Camera 1 Information	Camera 2 Information
Camera Idle	Camera Idle
Cooler Regulating Sensor Temp: 5.0 Setpoint: 5.0	Cooler Regulating Sensor Temp: 20.0 Setpoint: 20.0

3D(1)

# ogniskowanie obrazu odbywa się na pojedynczej gwiazdce

Maxim DL Pro 6 - CCD Image 2

File Edit View Analyze Process Filter Color Plug-in Window Help

CCD Image 2

CCD Image 2

Camera Control

Expose | Guide | Setup |

Exposure Preset: Find Star | Seconds: 2 | Idle | Start | Stop

Readout Mode: Normal | Subframe:  On  Move |  Auto

Speed: 100 | Frame Type: Light

Filter Wheel: Luminance

X Binning: 1 | Y Binning: Gamma | Camera 1 | Camera 2

Camera 1 Information: Camera Idle  
Cooler Regulating  
Sense Temp: 5.0  
Setpoint: 5.0

Camera 2 Information: Camera Idle  
Cooler Regulating  
Sense Temp: 20.0  
Setpoint: 20.0

3D(1)

768x511 100% (519, 402) i 100.000

Right-click for options, or roll mouse wheel to zoom. CTRL or SHIFT for more options.

## jej wyboru dokonujemy za pomocą opcji Subframe i Mouse

Maxim DL Pro 6 - CCD Image 2

File Edit View Analyze Process Filter Color Plug-in Window Help

CCD Image 2

CCD Image 2

Camera Control

Expose | Guide | Setup |

Exposure Preset: Find Star

Seconds: 2

Readout Mode: Normal

Speed: [ ]

Frame Type: Light

Filter Wheel: Luminance

Subframe:  On  Mouse

X Binning: 1 Y Binning: Gamma

Camera 1 Information: Camera Idle

Camera 2 Information: Camera Idle

Cooler Regulating Sensor Temp: 5.0 Setpoint: 5.0

Cooler Regulating Sensor Temp: 20.0 Setpoint: 20.0

3D(1)

For Help, press F1

768x511 100%

Maxim DL Pro 6 - CCD Image 2

File Edit View Analyze Process Filter Color Plug-in Window Help

100%

CCD Image 2

CCD Image 2

Camera Control

Expose | Guide | Setup |

Exposure Preset  
Find Star

Seconds  
2

Start

Readout Mode  
Normal

Subframe  
On Mouse

Speed  
100

Frame Type  
Light

X-Binning  
1

Y-Binning  
Same

Camera 1  
Camera 2

Options  
Single  
Continuous  
Autosave

Camera 1 Information  
Camera Idle  
Cooler Regulating  
Sensor Temp: 5.0  
Setpoint: 5.0

Camera 2 Information  
Camera Idle  
Cooler Regulating  
Sensor Temp: 20.0  
Setpoint: 20.0

3D(1)

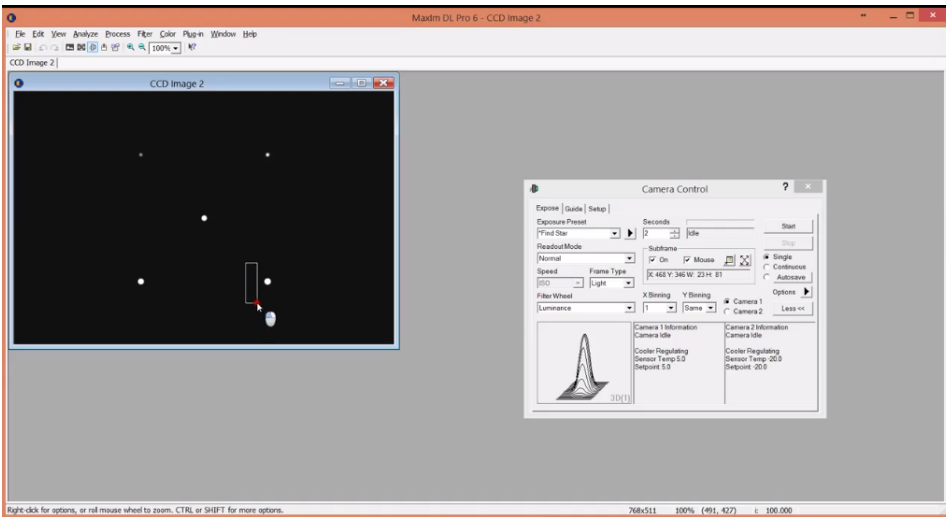
For Help, press F1

768x511 100%

The screenshot displays the Maxim DL Pro 6 software interface. On the left, a window titled 'CCD Image 2' shows a dark field with several bright stars. The main area is a large grey rectangle. On the right, a 'Camera Control' panel is open, showing various settings for exposure, readout mode, speed, and camera information. The panel includes a 3D histogram and status indicators for two cameras.

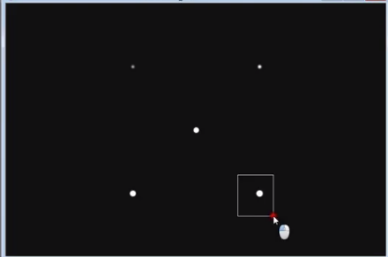


za pomocą myszy zaznaczamy nieduży obszar wokół wybranej gwiazdy



CCD Image 2

CCD Image 2



### Camera Control

Expose | Guide | Setup | ?

Exposure Preset: Find Star | Seconds: 2 | Idle | Start

Readout Mode: Normal | Subframe:  On  Mouse  X2

Speed: [Icon] | Frame Type: Light | X: 468 Y: 346 W: 72 H: 83 | Stop

Filter Wheel: Luminance | X Binning: 1 | Y Binning: Gamma | Camera 1 | Camera 2 | Options | Less <<

Camera 1 Information	Camera 2 Information
Camera Idle	Camera Idle
Cooler Regulating Sensor Temp: 5.0 Setpoint: 5.0	Cooler Regulating Sensor Temp: 20.0 Setpoint: 20.0

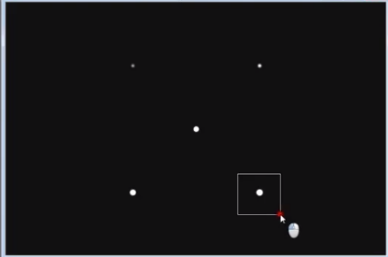
3D(1)

Right-click for options, or rol mouse wheel to zoom. CTRL or SHIFT for more options.

768x511 100% (540, 429) 100.000

CCD Image 2

CCD Image 2



## Camera Control

Expose | Guide | Setup

Exposure Preset

Find Star

Seconds

2

Idle

Start

Readout Mode

Normal

Subframe

On

Mouse

Single

Continuous

Speed

100

Frame Type

Light

X: 468 Y: 346 W: 66 H: 62

Autosave

Filter Wheel

Luminance

1

X Binning

Y Binning

Same

Camera 1

Camera 2

Options

Less &lt;&lt;



Camera 1 Information

Camera Idle

Cooler Regulating  
Sensor Temp: 5.0  
Setpoint: 5.0

Camera 2 Information

Camera Idle

Cooler Regulating  
Sensor Temp: 20.0  
Setpoint: 20.0

Maxim DL Pro 6 - CCD Image 2

File Edit View Analyze Process Filter Color Plug-in Window Help

CCD Image 2

CCD Image 2

Camera Control

Expose | Guide | Setup |

Exposure Preset: Find Star | Seconds: 2 | 0 of 2 sec

Readout Mode: Normal | Subframe: On | Mouse

Speed: [ ] | Frame Type: Light | X Binning: 1 | Y Binning: Gamma

Filter Wheel: Luminance

Camera 1 Information: Exposing Light, 0 of 2 000 sec, Filter Luminance, Cooler Regulating, Sensor Temp 5.0, Setpoint 5.0

Camera 2 Information: Camera Idle, Cooler Regulating, Sensor Temp 20.0, Setpoint 20.0

3D(1)

For Help, press F1

768x511 100%

wynikiem jest klatka obrazu z gwiazdą do ogniskowania

The screenshot displays the Maxm DL Pro 6 - CCD Image 3 software interface. The main window shows a dark image with a single bright star. A 'Camera Control' dialog box is open, providing various settings for the camera. The 'Exposure Preset' is set to 'Find Star', and the 'Seconds' value is 2. The 'Readout Mode' is 'Normal', and the 'Speed' is 'Light'. The 'Filter Wheel' is set to 'Luminance'. The 'X Binning' and 'Y Binning' are both set to 1. The 'Camera 1' and 'Camera 2' information sections show 'Camera Idle' and 'Cooler Regulating' status with sensor temperatures and setpoints.

Maxm DL Pro 6 - CCD Image 3

File Edit View Analyze Process Filter Color Plug-in Window Help

100%

CCD Image 3

Camera Control

Expose | Guide | Setup |

Exposure Preset: Find Star

Seconds: 2

Readout Mode: Normal

Speed: Light

Filter Wheel: Luminance

X Binning: 1

Y Binning: 1

Camera 1 Information: Camera Idle

Camera 2 Information: Camera Idle

Cooler Regulating Sensor Temp: 5.0 Setpoint: 5.0

Cooler Regulating Sensor Temp: 20.0 Setpoint: 20.0

Start Stop

Single Continuous Autocast

Options Less <<

3D(1)

For Help, press F1

86x82 100%

# wybieramy Options

Maxim DL Pro 6 - CCD Image 3

File Edit View Analyze Process Filter Color Plug-in Window Help

100%

CCD Image 3

Expose | Guide | Setup |

Exposure Preset  
Find Star

Readout Mode  
Normal

Speed  
Lght

Filter Wheel  
Lumance

Seconds  
2

Subframe  
On Mouse

X Binning  
1

Y Binning  
Gamma

Camera 1  
Camera 2

Start  
Stop

Single  
Continuous  
Autosave

Options  
Less <<

Camera 1 Information  
Camera Idle  
Cooler Regulating  
Sensor Temp: 5.0  
Setpoint: 5.0

Camera 2 Information  
Camera Idle  
Cooler Regulating  
Sensor Temp: 20.0  
Setpoint: 20.0

3D(1)

For Help, press F1

86x82 100%

# i Display Large Statistic

Maxim DL Pro 6 - CCD Image 3

File Edit View Analyze Process Filter Color Plug-in Window Help

CCD Image 3

Camera Control

Expose | Guide | Setup |

Exposure Preset: Find Star | Seconds: 2 | Start

Readout Mode: Normal | Subframe: On | Mouse | Single

Speed: 100 | Frame Type: Light | X: 468 Y: 346 W: 86 H: 82 | Continuous

Filter Wheel: Luminance | X Binning: 1 | Y Binning: 1 | Camera 1 | Camera 2 | Autosave

Options: Less <<

Camera 1 Information: Camera Idle | Cooler Regulating | Sensor Temp: 5.0 | Setpoint: 5.0

Camera 2 Information: Camera Idle | Cooler Regulating | Sensor Temp: 20.0 | Setpoint: 20.0

3D(1)

No Calibration  
Simple Auto-dark  
Full Calibration  
Reset Auto-dark  
Reset All Auto-dark  
**Display Large Statistics**  
Pause Exposure  
Resume Exposure  
Resume Autosave  
Set Image Save Path...  
Auto-Subfolder  
New Subfolder at  
Auto Save All Exposures  
Camera Settings...  
Exposure Delay...  
Auto-Tricolor  
New Buffer (Single Only)  
Screen During Exposures  
Expose Auto Script  
Auto Script Settings...  
Measure Shutter Latency...  
Show Tool Tips

For Help, press F1

86x82 100%

pojawia się okno z dobrze widocznymi informacjami o położeniu gwiazdy i cechach jej obrazu

The screenshot displays the MaxIm DL Pro 6 - CCD Image 3 software interface. The main window shows a dark image with a single bright star. A 'Focus Statistics' window is overlaid on the left, displaying the following data:

- X: 44
- Y: 37
- Max: 2091
- FWHM: 4.45
- 1/2 FD: 5.39

The 'Camera Control' window is open on the right, showing various camera settings:

- Exposure Preset: Find Star
- Exposure: 2 Seconds
- Readout Mode: Normal
- Speed: 1000
- Frame Type: Light
- Filter Wheel: Luminance
- X Binning: 1
- Y Binning: Gamma
- Camera 1 Information: Camera Idle
- Camera 2 Information: Camera Idle

At the bottom of the main window, the status bar indicates '86x82 100%'.



zmieniamy tryb ekspozycji z Single na Continuous

The screenshot displays the Maxm DL Pro 6 - CCD Image 3 interface. The main window shows a dark image with a small white spot. A 'Focus Statistics' window is overlaid on the left, displaying the following data:

- X: 44
- Y: 37
- Max: 2091
- FWHM: 4.45
- 1/2 FD: 5.39

The 'Camera Control' window is open on the right, showing the following settings:

- Exposure Preset: Find Star
- Seconds: 2
- Readout Mode: Normal
- Speed: 100
- Frame Type: Light
- Filter Wheel: Luminance
- Subframe: On
- X Binning: 1
- Y Binning: Gamma
- Start/Stop buttons
- Single/Continuous/Positive/Options buttons
- Camera 1 and Camera 2 information panels

At the bottom of the software window, it says 'For Help, press F1' on the left and '86x82 100%' on the right.

Maxim DL Pro 6 - CCD Image 3

File Edit View Analyze Process Filter Color Plug-in Window Help

CCD Image 3 | 100%

Focus Statistics

X: 44  
Y: 37  
Max: 2091  
FWHM: 4.45  
1/2 FD: 5.39

Camera 1  
Camera 2

Camera Control

Expose | Guide | Setup

Exposure Preset: Find Star  
Seconds: 2 of 2 sec

Readout Mode: Normal  
Speed: [ ]  
Frame Type: Light

Filter Wheel: Luminance

X Binning: 1 Y Binning: [ ]

Camera 1 Information: Exposing Light, 0 of 2000 sec, Filter Luminance, Cooler Regulating, Sensor Temp 5.0, Setpoint 5.0

Camera 2 Information: Camera Idle, Cooler Regulating, Sensor Temp 20.0, Setpoint 20.0

86x82 100%

wykonywana jest seria ekspozycji, w tym czasie można zmieniać ognisko teleskopu i kontrolować efekty

The screenshot displays the MaxDL Pro 6 - CCD Image 9 software interface. The main window shows a dark field with a single bright star. Two panels are overlaid on the main view:

- Focus Statistics:** A white box containing the following text:
  - X: 44
  - Y: 37
  - Max: 2091
  - FWHM: 4.45
  - 1/2 FD: 5.39
- Camera Control:** A panel with various settings and information:
  - Exposure Preset: Find Star
  - Exposure: 2 Seconds
  - Readout Mode: Normal
  - Speed: 100
  - Filter Wheel: Luminance
  - Camera 1 Information: Reading CCD camera, 2 000 of 2 000 sec, Filter Luminance, Cooler Regulating, Sensor Temp 5.0, Setpoint 5.0
  - Camera 2 Information: Camera Idle, Cooler Regulating, Sensor Temp 20.0, Setpoint -20.0

At the bottom of the window, the status bar shows "86x82" and "100%".

CCD Image 3



### Camera Control

Expose | Guide | Setup |

Exposure Preset: Find Star

Seconds: 2 0 of 2 sec. Start

Readout Mode: Normal

Speed: 800 Frame Type: Light

Fiber Wheel: Luminance

Subframe: On Mouse Stop

X Binning: 1 Y Binning: Same Options

Camera 1 Information: Exposing Light 0 of 2,000 sec. Filter: Luminance Cooler Regulating Sensor Temp: 5.0 Setpoint: 5.0

Camera 2 Information: Camera Idle Cooler Regulating Sensor Temp: 20.0 Setpoint: 20.0

Single Continuous Autosave

Less <<

po zogniskowaniu odznaczamy opcję Subframe i wykonujemy obraz kontrolny całego pola kamery w trybie Single

The screenshot displays the Maxim DL Pro 6 software interface. The main window, titled "Maxim DL Pro 6 - CCD Image 11", shows a dark field with several bright spots. A smaller window titled "CCD Image 11" is also visible. The "Camera Control" panel is open, showing the following settings:

- Expose | Guide | Setup |
- Exposure Preset: Find Star
- Seconds: 2
- Subframe:  On
- Speed: Normal
- Frame Type: Light
- Filter Wheel: Luminance
- X Binning: 1
- Y Binning: Gamma
- Camera 1: Camera 1
- Camera 2: Camera 2

The "Camera 1 Information" and "Camera 2 Information" sections show "Camera Idle" and "Cooler Regulating Sensor Temp 5.0 Setpoint 5.0" respectively. The "3D(1)" plot shows a single peak. The status bar at the bottom indicates "768x511 100%".

w celu wykonania właściwej sekwencji obrazów używamy trybu ekspozycji Autosave

The screenshot displays the Maxim DL Pro 6 software interface. The main window title is "Maxim DL Pro 6". The menu bar includes "File", "Edit", "View", "Analyze", "Process", "Filter", "Color", "Plug-in", "Window", and "Help". The toolbar contains various icons for file operations and camera control. The main workspace is a large grey area. A "Camera Control" dialog box is open in the foreground, featuring the following controls:

- Expose | Guide | Setup** (tabbed)
- Exposure Preset:** "Find Star" (dropdown), "2" (seconds), "Idle" (mode)
- Readout Mode:** "Normal" (dropdown), "Subframe" (checkbox), "On" (checkbox), "Mouse" (checkbox), "A2" (checkbox)
- Speed:** "Light" (dropdown), "K 468 Y 346 W 86 H 82" (coordinates)
- Filter Wheel:** "Luminance" (dropdown), "X Binning" (dropdown), "Y Binning" (dropdown), "Camera 1" (radio), "Camera 2" (radio)
- Buttons:** "Start", "Stop", "Single", "Continuous", "Autosave" (highlighted with a red box), "Options", "Less <<"
- Camera Information:** Two columns showing "Camera 1 Information" and "Camera 2 Information", both currently "Camera Idle".
- Graph:** A 3D plot labeled "3D(1)" showing a peak.

At the bottom left of the software window, it says "For Help, press F1". At the bottom of the image, there are navigation icons for a presentation slide.

## otwiera się okno ustawień

Maxim DL Pro 6

### Autosave Setup

Autosave Filename: [dropdown]  
Autosave Image: [dropdown]  
Estimated Duration: [dropdown]  
Delay First: [dropdown] Delay Between: [dropdown]  
Mosaic: Capture [checkbox] Setup [button]  
Dither: [dropdown] Max. DNR [pixels]: [dropdown]  
[Only] [dropdown]  
Automatic Resync:  
 Off  
 Sync Telescope  
 Correct via Dew  
 Solve Only Interval: [dropdown]  
[Save DCR] [dropdown]  
Buttons: OK, Cancel, Apply, Options

Star	Type	Filter	Suffix	Exposure	Binning	Speed	Readout Mode	Repeat	Script
1	Light	Red		[dropdown]	[dropdown]	[N/A]	Normal	[dropdown]	[dropdown]
2	Light	Red		[dropdown]	[dropdown]	[N/A]	Normal	[dropdown]	[dropdown]
3	Light	Red		[dropdown]	[dropdown]	[N/A]	Normal	[dropdown]	[dropdown]
4	Light	Red		[dropdown]	[dropdown]	[N/A]	Normal	[dropdown]	[dropdown]
5	Light	Red		[dropdown]	[dropdown]	[N/A]	Normal	[dropdown]	[dropdown]
6	Light	Red		[dropdown]	[dropdown]	[N/A]	Normal	[dropdown]	[dropdown]

### Camera Control

Expose | Guide | Setup |  
Exposure Preset: [Find Star] [dropdown] [2] [dropdown] [Idle] [dropdown] Start [button] Stop [button]  
Readout Mode: [Normal] [dropdown] Subframe:  On  Mouse [dropdown] [dropdown]  
Speed: [100] [dropdown] Frame Type: [Light] [dropdown]  
Filter Wheel: [Luminance] [dropdown] X Binning: [1] [dropdown] Y Binning: [Same] [dropdown] Camera 1 [checkbox] Camera 2 [checkbox]  
Options: [Less <<] [button]  
Camera 1 Information: Camera Idle  
Cooler Regulating: Sensor Temp: 5.0 Setpoint: 5.0  
Camera 2 Information: Camera Idle  
Cooler Regulating: Sensor Temp: 20.0 Setpoint: 20.0  
3D(1) [image]

For Help, press F1

ustalamy pierwszy człon nazwy plików przechowujących obrazy oraz wartości opóźnień w ich wykonywaniu

Maxim DL Pro 6

File Edit View Analyze Process Filter Color Plug-in Window Help

Autosave Setup

Autosave Filtrama: M42\_

Estimated Duration: 2s

Delay/First: 2 Delay/Between: 10

Other: Off Max Dev: [pixels]

Automatic Re-sync:  Off

Sync Telescope

Connect via Slow

Solve Only Interval: 1

Mosaic:  Capture Setup

Options: Script

Slot	Type	Filter	Subfr	Exposure	Binning	Speed	Readout Mode	Repeat	Script
1	Light	Red		f	f	N/A	Normal	f	...
2	Light	Red		f	f	N/A	Normal	f	...
3	Light	Red		f	f	N/A	Normal	f	...
4	Light	Red		f	f	N/A	Normal	f	...
5	Light	Red		f	f	N/A	Normal	f	...
6	Light	Red		f	f	N/A	Normal	f	...

Camera Control

Expose | Guide | Setup

Exposure Preset: Find Star

Seconds: 2

Readout Mode: Normal

Speed: ISO

Frame Type: Light

Filter Wheel: Luminance

X Binning: 1 Y Binning: Same

Camera 1: Camera 1 Camera 2: Camera 2

Start Stop

Single Continuous Autosave Options

3D(1)

Camera 1 Information: Camera Idle

Cooler Regulating Sensor Temp: 5.0 Setpoint: 5.0

Camera 2 Information: Camera Idle

Cooler Regulating Sensor Temp: 20.0 Setpoint: 20.0

For Help, press F1



Maxim DL Pro 6

File Edit View Analyze Process Filter Color Plug-in Window Help

Autosave Setup

Autosave Filename: M42\_

Other: [OI] Max Dev: [pixels]

Estimated Duration: [1s]

Delay-First: [2] Delay-Between: [2]

Mosaic: [Capture] Setup

Automatic ReSync:
 

- Off
- Sync Telescope
- Connect on Slow
- Solve Only Interval
- No Sync

Options

Slot	Type	Filter	Suffix	Exposure	Binning	Speed	Readout Mode	Repeat	Script
1	Light	Red		0.000	1	N/A	Normal	1	...
2	Blue	Red		0.000	1	N/A	Normal	1	...
3	Dark Flat	Red		0.000	1	N/A	Normal	1	...
4	Light	Red		0.000	1	N/A	Normal	1	...
5	Light	Red		0.000	1	N/A	Normal	1	...
6	Light	Red		0.000	1	N/A	Normal	1	...

Camera Control

Expose | Guide | Setup

Exposure Preset: [Find Star] Seconds: [2] [Idle] [Start]

Readout Mode: [Normal] Subframe: [On] [Mouse] [Stop]

Speed: [100] Frame Type: [Light] [X 468 Y 346 W: 85 H: 82] [Single] [Continuous] [Autosave]

Filter Wheel: [Luminance] X Binning: [1] Y Binning: [Same] Camera 1: [Camera 1] Camera 2: [Camera 2] [Options] [Less <<]

Camera 1 Information  
Camera Idle  
Cooler Regulating  
Sensor Temp 5.0  
Setpoint 5.0

Camera 2 Information  
Camera Idle  
Cooler Regulating  
Sensor Temp 20.0  
Setpoint 20.0

3D(1)

ustalamy rodzaj filtra, czas ekspozycji i ilość powtórzeń dla kilku zestawów wymienionych parametrów

Maxim DL Pro 6

File Edit View Analyze Process Filter Color Plug-in Window Help

The screenshot shows the Maxim DL Pro 6 software interface. Two panels are open: 'Autosave Setup' and 'Camera Control'.

**Autosave Setup Panel:**

- Autosave Filtrama:** M42\_
- Estimated Duration:** 1h
- Other:** Max. Dev. [pixels], [Off], [Yonly]
- Automatic Re-sync:**  Off,  Sync Telescope,  Connect via Slow,  Solve Only, Interval [1]
- Mosaic:**  Capture, Setup
- Delay/First:** [2], **Delay/Between:** [2]
- Options:** OK, Cancel, Apply, Script
- Table:**

Slot	Type	Filter	Suffix	Exposure	Binning	Speed	Readout Mode	Repeat	Script
1	Light	Red		0.000	1	N/A	Normal	1	...
2	Light	Red		0.000	1	N/A	Normal	1	...
3	Light	Red		0.000	1	N/A	Normal	1	...
4	Light	Red		0.000	1	N/A	Normal	1	...
5	Light	Red		0.000	1	N/A	Normal	1	...
6	Light	Red		0.000	1	N/A	Normal	1	...

**Camera Control Panel:**

- Expose | Guide | Setup |**
- Exposure Preset:** Find Star, [2], [Idle], Start, Stop
- Readout Mode:** [Normal], Subframe  On,  Mouse, [1], [2], [3], [4], [5], [6], [7], [8], [9], [0], [Single], [Continuous],  Autosave, Options
- Speed:** [100], **Frame Type:** [Light]
- Filter Wheel:** [Luminance], X Binning [1], Y Binning [Same], Camera 1, Camera 2, Less <<
- Camera 1 Information:** Camera Idle, Cooler Regulating, Sensor Temp: 5.0, Setpoint: 5.0
- Camera 2 Information:** Camera Idle, Cooler Regulating, Sensor Temp: 20.0, Setpoint: 20.0
- Graph:** 3D(1)

For Help, press F1

dojemy człon do nazwy w postaci kodu filtra

Maxim DL Pro 6

File Edit View Analyze Process Filter Color Plug-in Window Help

Autosave Setup

Autosave Filtrama [M42\_]  
Estimated Duration [is]  
Delay/First [2] Delay/Between [2]  
Other: [Off] Max Dev [pixels] [Yonly] [1]  
Automatic Re-sync:  Off  Sync Telescope  Contact via Slow  Solve Only Interval [1] [Use D42] [1]  
Mosaic:  Capture [Setup]  
Options [Script]

Slot	Type	Filter	Suffix	Exposure	Binning	Speed	Readout Mode	Repeat
1	Light	Red	A	0.000	1	N/A	Normal	1
2	Light	Green	G	0.000	1	N/A	Normal	1
3	Light	Blue	B	0.000	1	N/A	Normal	1
4	Light	Red		0.000	1	N/A	Normal	1
5	Light	Red		0.000	1	N/A	Normal	1
6	Light	Red		0.000	1	N/A	Normal	1

Camera Control

Expose | Guide | Setup |

Exposure Preset [Find Star] [2] [Idle] [Start] [Stop]  
Readout Mode [Normal] [Subframe]  On  Mouse [1] [2] [3] [4] [5] [6] [7] [8] [9] [0] [Single] [Continuous] [Autosave] [Options] [Less <<]  
Speed [0.00] [Frame Type] [Light] [X 468 Y 346 W: 86 H: 82]  
Filter Wheel [Luminance] X Binning [1] Y Binning [Same] Camera 1 [Camera 2] [Less <<]  
Camera 1 Information Camera Idle  
Cooler Regulating Sensor Temp: 5.0 Setpoint: 5.0  
Camera 2 Information Camera Idle  
Cooler Regulating Sensor Temp: 20.0 Setpoint: 20.0  
3D(1)

For Help, press F1

### Autosave Setup

Autosave Filtrana: [M42\_]

Estimated Duration: [21s]

Delay/First: [2] Delay/Between: [2]

Other: [Off] Max Dev: [pixels]

Automatic Resync:  Off  
 Sync Telescope  
 Connect via Slow  
 Solve Only Interval: [1]

Mosaic:  Capture Setup

Options:

Slot	Type	Filter	Suffix	Exposure	Binning	Speed	Readout Mode	Repeat	Script
1	Light	Red	A	β	1	N/A	Normal	1	...
2	Light	Green	G	β	1	N/A	Normal	1	...
3	Light	Blue	B	β	1	N/A	Normal	1	...
4	Light	Red		0.000	1	N/A	Normal	1	...
5	Light	Red		0.000	1	N/A	Normal	1	...
6	Light	Red		0.000	1	N/A	Normal	1	...

Buttons: OK, Cancel, Apply

### Camera Control

Expose | Guide | Setup

Exposure Preset: [Find Star] Seconds: [2] [Idle] Start

Readout Mode: [Normal] Subframe:  On  Mouse

Speed: [000] Frame Type: [Light]  Single  Continuous  Autosave

Filter Wheel: [Luminance] X Binning: [1] Y Binning: [Same] Camera 1  Camera 2  Options: Less <<

Camera 1 Information  
Camera Idle  
Cooler Regulating  
Sensor Temp: 5.0  
Setpoint: 5.0

Camera 2 Information  
Camera Idle  
Cooler Regulating  
Sensor Temp: 20.0  
Setpoint: 20.0

### Autosave Setup

Autosave Filtrana: [M42\_]

Estimated Duration: [21s]

Delay/First: [0] Delay/Between: [2]

Other: [Off] Max. Dev: [pixels]

Automatic Re-sync:
 

- Off
- Sync Telescope
- Connect via Slow
- Solve Only

Mosaic:  Capture  Setup

Interval: [1] Use D42:

Options:

Slot	Type	Filter	Suffix	Exposure	Binning	Speed	Readout Mode	Repeat	Script
1	Light	Red	A	β	1	N/A	Normal	1	...
2	Light	Green	G	β	1	N/A	Normal	1	...
3	Light	Blue	B	β	1	N/A	Normal	1	...
4	Light	Red		0.000	1	N/A	Normal	1	...
5	Light	Red		0.000	1	N/A	Normal	1	...
6	Light	Red		0.000	1	N/A	Normal	1	...

### Camera Control

Expose | Guide | Setup

Exposure Preset: [Find Star] Seconds: [2] [Idle] [Start]

Readout Mode: [Normal] Subframe:  On  Mouse [1] [2] [3] [4] [5] [6] [7] [8] [9] [10] [11] [12] [13] [14] [15] [16] [17] [18] [19] [20] [21] [22] [23] [24] [25] [26] [27] [28] [29] [30] [31] [32] [33] [34] [35] [36] [37] [38] [39] [40] [41] [42] [43] [44] [45] [46] [47] [48] [49] [50] [51] [52] [53] [54] [55] [56] [57] [58] [59] [60] [61] [62] [63] [64] [65] [66] [67] [68] [69] [70] [71] [72] [73] [74] [75] [76] [77] [78] [79] [80] [81] [82] [83] [84] [85] [86] [87] [88] [89] [90] [91] [92] [93] [94] [95] [96] [97] [98] [99] [100]

Speed: [100] Frame Type: [Light]

Filter Wheel: [Luminance]

X Binning: [1] Y Binning: [Same] Camera 1:  Camera 2:  [Options] [Less <<]

Camera 1 Information: Camera Idle  
Cooler Regulating  
Sense Temp: 5.0  
Setpoint: 5.0

Camera 2 Information: Camera Idle  
Cooler Regulating  
Sense Temp: 20.0  
Setpoint: 20.0

# ustalamy folder zapisu

Maxim DL Pro 6

File Edit View Analyze Process Filter Color Plug-in Window Help

Autosave Setup

Autosave Filtrama: M42\_

Estimated Duration: 21s

Delay/First: 2 Delay/Between: 2

Other: [Off] Max. Dev. [pixels]

Automatic Resync:  Off  Sync Telescope  Contact via Slow  Solve Only Interval: 1

Mosaic:  Capture Setup

Slot	Type	Filter	Suffix	Exposure	Binning	Speed	Readout Mode	Repeat	Script
1	Light	Red	A	β	1	N/A	Normal	1	...
2	Light	Green	G	β	1	N/A	Normal	1	...
3	Light	Blue	B	β	1	N/A	Normal	1	...
4	Light	Red		0.000	1	N/A	Normal	1	...
5	Light	Red		0.000	1	N/A	Normal	1	...
6	Light	Red		0.000	1	N/A	Normal	1	...

Options:  Delay Between Light Frames Only

Camera Control

Expose | Guide | Setup

Exposure Preset: Find Star

Seconds: 2

Start Stop

Single Continuous Autosave Options

Set Image Save Path...  
Auto-Subfolder  
New Subfolder at:  
Scheduled Mode  
Same Repeat Count for All  
Same Script Name for All  
Group by Slot  
 Delay Between Light Frames Only  
Run Scripts Minimized  
Load Sequence...  
Save Sequence  
Save Sequence As...

Camera 1 Information: Camera 1 Idle

Camera 2 Information: Camera 2 Idle

Regulating Temp: 5.0

Cooler Regulating: Sensor Temp: 20.0 Setpoint: 20.0

For Help, press F1

### Autosave Setup

Autosave Filtrana: M42\_

Estimated Duration: 21s

Delay/First: 2    Delay/Between: 2

Other: [Off]    Max. Dev. [pixels]

Automatic Re-sync:
 

- Off
- Sync Telescope
- Connect via Slow
- Solve Only

Mosaic:  Capture    Setup

Interval:  Use D42    1

Options: **▶** Script

Slot	Type	Filter	Suffix	Exposure	Binning	Speed	Readout Mode	Repeat	Script
1	Light	Red	A	β	1	N/A	Normal	1	...
2	Light	Green	G	β	1	N/A	Normal	1	...
3	Light	Blue	B	β	1	N/A	Normal	1	...
4	Light	Red		0.000	1	N/A	Normal	1	...
5	Light	Red		0.000	1	N/A	Normal	1	...
6	Light	Red		0.000	1	N/A	Normal	1	...

### Camera Control

Expose | Guide | Setup

Exposure Preset: [Find Star]    Seconds: [2]    Idle

Start    Stop

Single  
 Continuous  
 Autosave

Options: **▶** Less <<

Set Image Save Path...  
 Auto-Subfolder  
 New Subfolder at:  
 Scheduled Mode  
 Same Repeat Count for All  
 Same Script Name for All  
 Group by Slot  
 Delay Between Light Frames Only  
 Run Scripts Minimized  
 Load Sequence...  
 Save Sequence  
 Save Sequence As...

Camera 1 Information: Camera 1 Idle

Camera 2 Information: Camera 2 Idle

Regulating Temp 5.0  
Cooler Regulating Resect Temp 20.0  
Setpoint 20.0

### Autosave Setup

Autosave Filtrama: M42\_

Estimated Duration: 21s

Delay/First: 2    Delay/Between: 2

Other: [Off]    Max Dev: [pixels]

Automatic Resync:
 

- Off
- Sync Telescope
- Connect via Slow
- Solve Only

Mosaic:  Capture    Setup

Interval: [1]

Options: Script

Slot	Type	Filter	Suffix	Exposure	Binning	Speed	Readout Mode	Repeat	Script
1	Light	Red	A	β	1	N/A	Normal	1	...
2	Light	Green	G	β	1	N/A	Normal	1	...
3	Light	Blue	B	β	1	N/A	Normal	1	...
4	Light	Red		0.000	1	N/A	Normal	1	...
5	Light	Red		0.000	1	N/A	Normal	1	...
6	Light	Red		0.000	1	N/A	Normal	1	...

### Camera Control

Expose | Guide | Setup

Exposure Preset: [Find Star]    Seconds: [2]    Idle

Start    Stop

Single  
 Continuous  
 Autosave

Options: Less <<

Set Image Save Path...  
 Auto-Subfolder  
 New Subfolder at:  
 Scheduled Mode  
 Same Repeat Count for All  
 Same Script Name for All  
 Group by Slot  
 Delay Between Light Frames Only  
 Run Scripts Minimized  
 Load Sequence...  
 Save Sequence  
 Save Sequence As...

Camera 1 Information: Camera 1 Idle  
 Camera 2 Information: Camera 2 Idle  
 Regulating Temp: 5.0  
 Cooler Regulating Resect Temp: 20.0  
 Setpoint: 20.0



gdy mamy do dyspozycji drugą kamerę lub kamerę typu DualChip - możemy użyć funkcji korekty śledzenia - autoguidingu

The screenshot shows the Maxim DL Pro 6 software interface. The main window title is "Maxim DL Pro 6". The menu bar includes File, Edit, View, Analyze, Process, Filter, Color, Plug-in, Window, and Help. The toolbar contains various icons for file operations and analysis. The main workspace is a large gray area. A "Camera Control" dialog box is open in the foreground, featuring tabs for "Expose", "Guide", and "Setup".

The "Camera Control" dialog box contains the following elements:

- Expose Tab:** Includes "Seconds" (set to 1), "Filter Wheel" (set to "No Filters"), and "Scope Dec." (set to 0). Buttons for "Start", "Expose", "Calibrate", "Track", and "Stop" are present.
- Setup Tab:** Includes checkboxes for "Auto Scope Dec.", "Pier Flip", "Auto Pier Flip", and "Watch Star".
- Guide Star:** Includes "X" and "Y" coordinates (both set to 0.0) with up/down arrows.
- Aggressiveness:** Includes "X" and "Y" values (both set to 0) with up/down arrows.
- Camera Selection:** Radio buttons for "Camera 1" and "Camera 2" (selected).
- Buttons:** "Settings", "Move", "Alarms", "Graph", "Options", and "Less <<".
- Information Panels:** Two panels at the bottom showing "Camera 1 Information" and "Camera 2 Information". Both show "Camera Idle", "Cooler Regulating", "Sensor Temp: 5.0", and "Setpoint: 5.0".
- Graph:** A small 3D plot showing a peak, labeled "3D(1)".

At the bottom left of the software window, it says "For Help, press F1". At the bottom right of the image, there are navigation icons for a presentation slide.



### Camera Control

Expose Guide Setup

Seconds: 1 Filter Wheel: No Filters Scope Dec: 0

Auto Scope Dec  Pier Flip  Auto Pier Flip  Watch Star

Camera 1  Camera 2

Guide Star: X: 0.0 Y: 0.0

Aggressiveness: X: 0 Y: 0

Settings Move

Expose:  Calibrate  Track Start Stop

Graph Options ▶


Alarms Less <<

Camera 1 Information  
Camera Idle

Camera 2 Information  
Camera Idle

Cooler Regulating  
Sensor Temp: 5.0  
Setpoint: 5.0

Cooler Regulating  
Sensor Temp: 20.0  
Setpoint: 20.0



## szczegóły prowadzenia, wybór osi

The screenshot displays the Maxim DL Pro 6 software interface. The main window title is "Maxim DL Pro 6". The menu bar includes "File", "Edit", "View", "Analyze", "Process", "Filter", "Color", "Plug-in", "Window", and "Help". The toolbar contains various icons for file operations and viewing. The main workspace is currently empty, showing a 3D plot of a star field.

The "Guider Settings" dialog box is open, showing the "Advanced" tab. The settings are as follows:

- X Axis:** Cal. Time: 10, Backlash: 0
- Y Axis:** Cal. Time: 10, Backlash: 0
- Anti-Stiction:** Off, 0 cycles, Small Stars
- Manual Calibration:** X Speed: 0, Y Speed: 0, Angle (deg): 0, Automatically Apply Spin Control Changes:
- Display Scaling:** Display Mode: Pixels, Delta:
- Guider Enables:**  X Axis,  -X Output,  X Output,  Y Axis,  -Y Output,  Y Output
- Autoguider Output:** Control Via: [Dropdown], COM Port: COM1, Serial Command: MOVE
- Exposure Settings:** Binning: 1, Let: 0, Top: 0, Width: 768, Height: 511, Readout Mode: Normal, Speed: 100

The "Camera Control" dialog box is also visible, showing settings for Scope Dec, Expose, Calibrate, Track, Graph, Alarms, and Options. It includes information for Camera 1 and Camera 2, such as Regulating Temp and Cooler Regulating Setpoint.

For help, press F1

Maxim DL Pro 6

File Edit View Analyze Process Filter Color Plug-in Window Help

30(1)

### Observatory

Catalog | Telescope | Dome | Focus | Status | Weather | Webcam | Setup

Options **Connect All** Disconnect All

Telescope	Connect	Disconnected	TheSky-controlled Telescc
Focuser 1	Connect	Disconnected	No Device Selected
Focuser 2	Connect	Disconnected	No Device Selected
Dome	Connect	Disconnected	No Device Selected
Rotator	Connect	Disconnected	No Device Selected
Webcam	Connect	Disconnected	USB2 HD LVC WebCam
Switch	Connect	Disconnected	No Device Selected
Bulbwood CS	Connect	Disconnected	Unavailable
Davis WS	Connect	Disconnected	Not Connected

Auto Shutdown

Enable

### Camera Control

Expose Guide Setup

Seconds Filter Wheel Scope Dec

1 No Filters 10


Auto Scope Dec  Auto Flip  Watch Star

Guide Star X 0 Y 0

Aggressiveness X 0 Y 0

Graph Options

Settings Move Alarms Less

 <p>3D(1)</p>	<p>Camera 1 Information</p> <p>Camera Idle</p> <p>Cooler Regulating</p> <p>Sensort Temp: 5.0</p> <p>Setpoint: 5.0</p>	<p>Camera 2 Information</p> <p>Camera Idle</p> <p>Cooler Regulating</p> <p>Sensort Temp: 20.0</p> <p>Setpoint: 20.0</p>
--	---	---

Show or hide the Observatory Control Window

### Observatory

Catalog | Telescope | Dome | Focus | Status | Weather | Webcam | Setup

Options Connect All Disconnect All

Telescope	▶ Connect	Disconnect	• TheSky-controlled Telesc
Focuser 1	▶ Connect	Disconnect	• No Device Selected
Focuser 2	▶ Connect	Disconnect	• No Device Selected
Dome	▶ Connect	Disconnect	• No Device Selected
Relator	▶ Connect	Disconnect	• No Device Selected
Webcam	▶ Connect	Disconnect	• USB23HD UVC WebCam
Switch	▶ Connect	Disconnect	• No Device Selected
Bellwood CS	▶ Connect	Disconnect	• Unavailable
Davis WS	▶ Connect	Disconnect	• Not Connected

Auto Shutdown

Enable Shutdown

Reset Options...

### Camera Control

Expose | Guide | Setup

Seconds Filter Wheel Scope Dec Expose Start

1 No Filters 10 Calibrate Stop

Auto Scope Dec Guide Star Track


Pier Flip X 0.0 Y 0.0

Auto Flip Flip Aggressiveness

Watch Star X 0 Y 0 Graph Options ▶

Camera 1 Settings Move Alarms Less <<

Camera 2



3D(1)

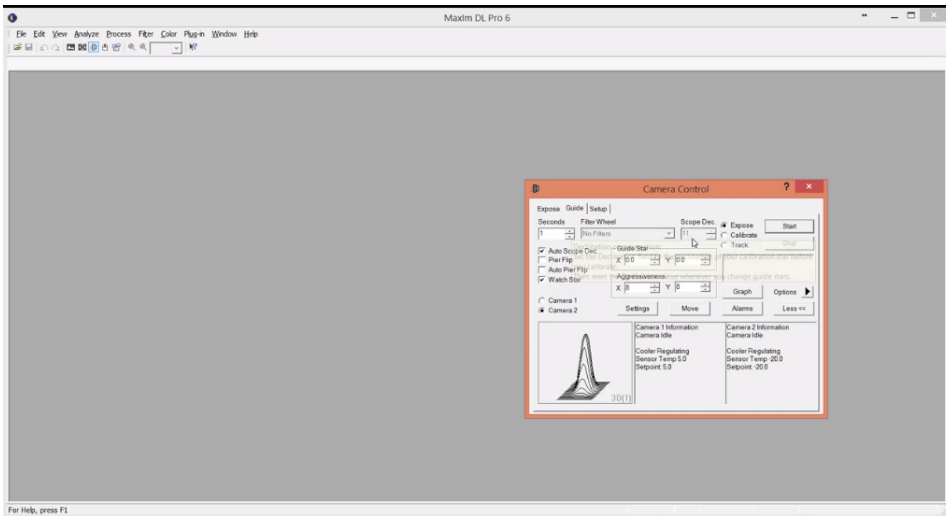
Camera 1 Information  
Camera Idle

Cooler Regulating  
Sensor Temp 5.0  
Setpoint 5.0

Camera 2 Information  
Camera Idle

Cooler Regulating  
Sensor Temp 20.0  
Setpoint 20.0

pozwala to zastosować poprawkę do deklinacji



wykonujemy ekspozycję pamiętając, że używamy tym razem kamery nr 2

Maxim DL Pro 6

File Edit View Analyze Process Filter Color Plug-in Window Help

3D(1)

### Camera Control

Expose Guide Setup

Seconds: 1 Filter Wheel: No Filters Scope Dec: 1

Expose Calibrate Track Stop

Auto Scope Dec.  Pier Flip  Auto Pier Flip  Watch Star

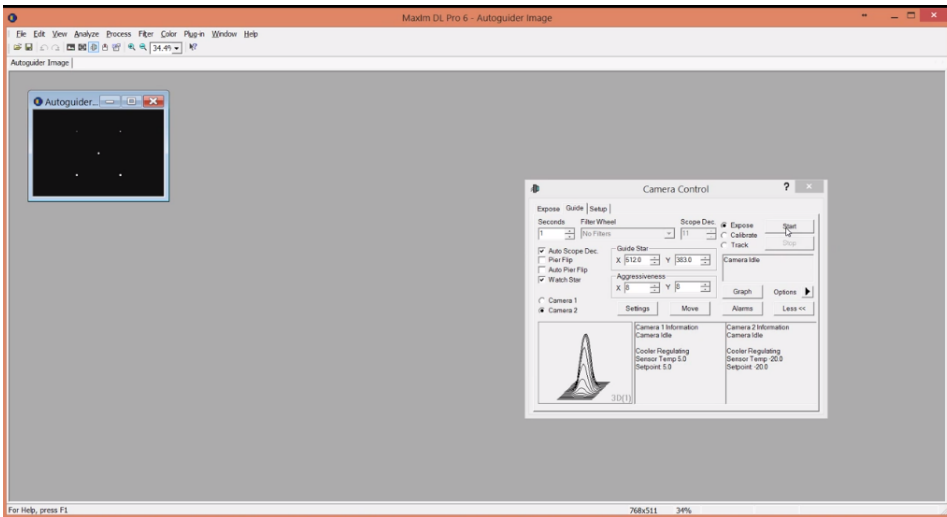
Guide Star X: 0 Y: 0 Aggressiveness X: 0 Y: 0

Camera 1 Camera 2 Settings Move Alarms Options Less <<

Camera 1 Information	Camera 2 Information
Camera Idle	Exposing Dark
Cooler Regulating Sensor Temp: 5.0 Setpoint: 5.0	Cooler Regulating Sensor Temp: 20.0 Setpoint: 20.0

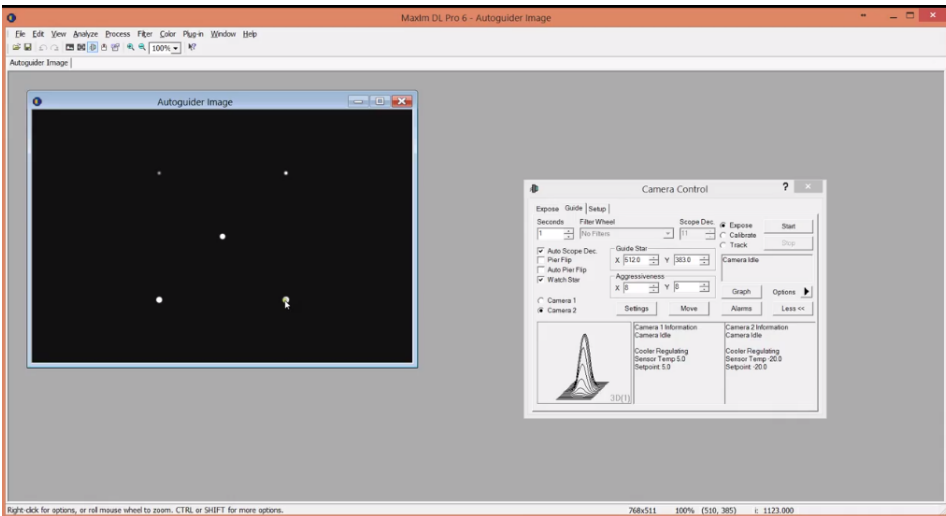
For Help, press F1

# pojawi się obraz z kamery do prowadzenia





program automatycznie wybiera do prowadzenia najjaśniejszą gwiazdę w polu



## kalibracja obrazu przebiega w kilku krokach

Maxim DL Pro 6 - Autoguider Image

File Edit View Analyze Process Filter Color Plug-in Window Help

Autoguider Image

Autoguider Image

Camera Control

Expose Guide Setup

Seconds Filter Wheel Scope Dec. Expose Start

1 No Filters 11 11 Calibrate Stop

Flack

Auto Scope Dec. Guide Star X 512.0 Y 383.0

Pier Flip Auto Pier Flip Aggressiveness

Watch Star X 0 Y 0

Camera 1 Settings Move Alarms Options

Camera 2

Camera 1 Information Camera 2 Information

Camera Idle Camera Idle

Cooler Regulating Sensor Temp 5.0 Setpoint 5.0

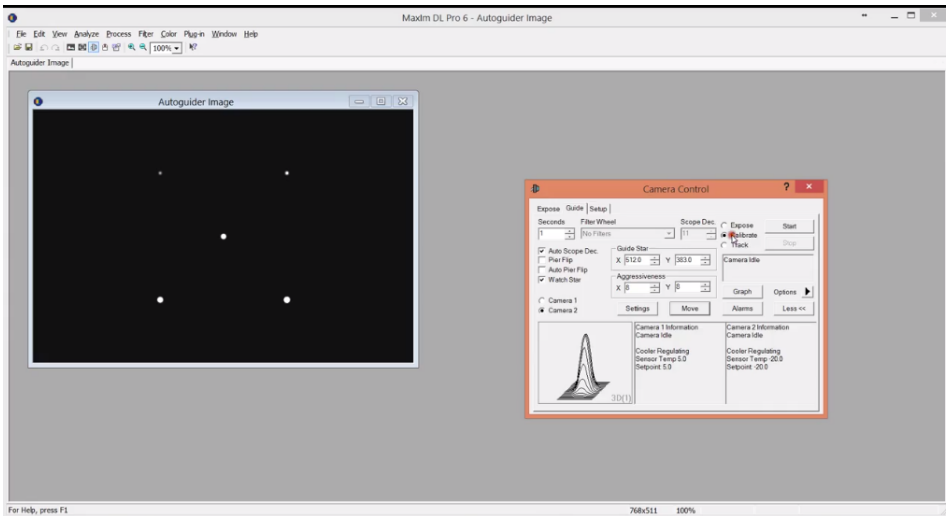
Cooler Regulating Sensor Temp 20.0 Setpoint 20.0

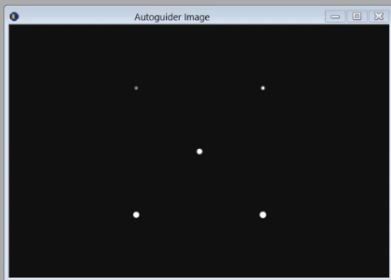
3D(1)

Graph Less <<

For Help, press F1

768x511 100%





### Camera Control

Expose Guide Setup

Seconds: 1 Filter Wheel: No Filters Scope Dec: 11

Expose:  Expose    
 Calibrate  Track

Auto Scope Dec: Guide Star: X: 12.0 Y: 103.0  
 Pier Flip  
 Auto Pier Flip  
 Watch Star Aggressiveness: X: 0 Y: 0

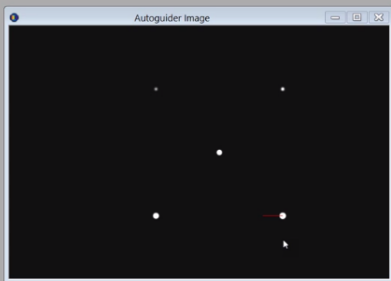
Camera 1  Camera 2

Settings Move Alarms Less <<

Graph Options ▶

Camera 1 Information	Camera 2 Information
Camera Idle	Exposing Light
Cooler Regulating Sensor Temp: 5.0 Setpoint: 5.0	Cooler Regulating Sensor Temp: 20.0 Setpoint: 20.0

3D(1)



### Camera Control

Expose Guide Setup

Seconds: 1 Filter Wheel: No Filters Scope Dec: 1

Auto Scope Dec.  Guide Star: X: 512.0 Y: 383.0

Pier Flip  Auto Pier Flip  Aggressiveness: X: 0 Y: 0

Watch Star

Camera 1  Camera 2

Settings Move Alarms Less <<

Expose: Start Calibrate Track: Stop

Graph Options ▶

<p>3D(1)</p>	<b>Camera 1 Information</b> Camera Idle Cooler Regulating Sensor Temp: 5.0 Setpoint: 5.0	<b>Camera 2 Information</b> Reading CCD camera X Pos: 512, YPos: 383 X Pos: 552, YPos: 383 Cooler Regulating Sensor Temp: -20.0 Setpoint: -20.0
	<b>Reading CCD camera</b> X Pos: 512, YPos: 383 X Pos: 552, YPos: 383	
	<b>Cooler Regulating</b> Sensor Temp: -20.0 Setpoint: -20.0	



### Camera Control

Expose Guide Setup

Seconds: 1 Filter Wheel: No Filters Scope Dec: 11

Expose   
 Calibrate   
 Track

Auto Scope Dec. Guide Star: X: 512.0 Y: 383.0  
 Pier Flip  
 Auto Pier Flip Aggressiveness  
 Watch Star X: 0 Y: 0

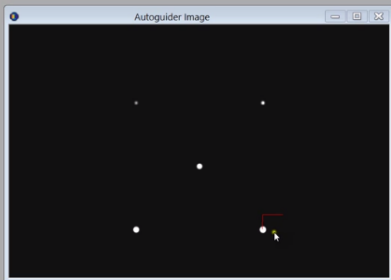
Camera 1  
 Camera 2

Settings Move Alarms Less <<

Graph Options ▶

	Camera 1 Information	Camera 2 Information
	Camera Idle	Reading CCD camera
	Cooler Regulating Sensor Temp: 5.0 Setpoint: 5.0	X Pos: 512, YPos: 383 X Pos: 512, YPos: 383 X Pos: 512, YPos: 383 Cooler Regulating Sensor Temp: 20.0 Setpoint: 20.0

Autoguider Image |



### Camera Control

Expose Guide Setup

Seconds: 1 | Filter Wheel: No Filters | Scope Dec: 11

Expose   
 Calibrate  
 Track

Auto Scope Dec: Guide Star: X: 512.0 Y: 383.0  
 Auto Pier Flip: Aggressiveness: X: 0 Y: 0  
 Watch Star

Camera 1  Camera 2

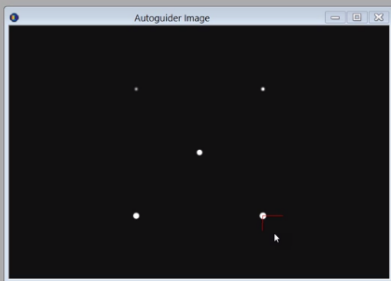
Settings Move Alarms Less <<

Camera 1 Information	Camera 2 Information
Camera Idle	Exposing Light
Cooler Regulating	X Pos: 512, YPos: 383
Sensor Temp: 5.0	X Pos: 552, YPos: 383
Setpoint: 5.0	X Pos: 511, YPos: 413
	Cooler Regulating
	Sensor Temp: 20.0
	Setpoint: 20.0

3D(1)

Right click for options, or rol mouse wheel to zoom. CTRL or SHIFT for more options.

768x511 100% (535, 419) 100.000



### Camera Control

Expose Guide Setup

Seconds: 1 Filter Wheel: No Filters Scope Dec: 1

Expose   
 Calibrate   
 Track

Auto Scope Dec. Guide Star: X: 512.0 Y: 383.0  
 Pier Flip  
 Auto Pier Flip  
 Watch Star Aggressiveness: X: 0 Y: 0  
 Camera 1  
 Camera 2

Settings Move Alarms Less <<

Camera 1 Information	Camera 2 Information
Camera Idle	Camera Idle
Cooler Regulating	X Pos: 512, YPos: 383
Sensor Temp: 5.0	X Pos: 502, YPos: 383
Setpoint: 5.0	X Pos: 512, YPos: 383
	X Pos: 511, YPos: 413
	X Pos: 512, YPos: 383
	Cooler Regulating
	Sensor Temp: 20.0

Graph Options

3D(1)

uruchamiamy korektę śledzenia, podczas której co sekundę będzie wykonywana klatka kontrolna

Maxim DL Pro 6 - Autoguider Image

File Edit View Analyze Process Filter Color Plug-in Window Help

Autoguider Image | 100%

Autoguider Image

Camera Control

Expose Guide Setup

Seconds: 1 Filter Wheel: No Filters Scope Dec.: 1

Expose Start  
Calibrate Stop

Guide Star  
X: 512.0 Y: 383.0

Aggressiveness  
X: 0 Y: 0

Camera 1  
Camera 2

Settings Move Alarms Options Less <<

Camera 1 Information  
Camera Idle  
Cooler Regulating  
Sensor Temp: 5.0  
Setpoint: 5.0

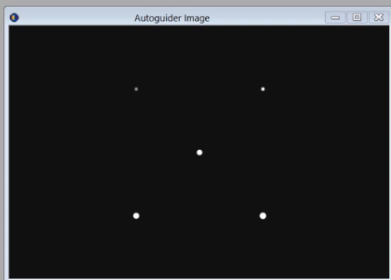
Camera 2 Information  
Camera Idle  
Cooler Regulating  
Sensor Temp: 20.0  
Setpoint: 20.0

3D(1)

For Help, press F1

768x511 100%





### Camera Control

Expose Guide Setup

Seconds: 1 | Filter Wheel: No Filters | Scope Dec: 11

Expose  Start  
 Calibrate  Stop

Auto Scope Dec. | Guide Star: X: 12.0 | Y: 183.0  
 Pier Flip | Aggressiveness: X: 0 | Y: 0  
 Watch Star

Camera 1  
 Camera 2

Settings | Move | Alarms | Options | Less <<

	<b>Camera 1 Information</b> Camera Idle Cooler Regulating Sensor Temp: 5.0 Setpoint: 5.0	<b>Camera 2 Information</b> Exposing Light Cooler Regulating Sensor Temp: 20.0 Setpoint: 20.0



### Camera Control

Expose Guide Setup

Seconds: 1 Filter Wheel: No Filters Scope Dec: 1


Expose  Calibrate   
 Track

Auto Scope Dec: Guide Star: X: 12.0 Y: 183.0 Exposing Light: X Err: 0.0, Y Err: 0.50

Pier Flip: X: 0 Y: 0 Aggressiveness: X: 0 Y: 0 Graph Options ▶

Watch Star

Camera 1  Camera 2 Settings Move Alarms Less <<

 3D(1)	Camera 1 Information Camera Idle Cooler Regulating Sensor Temp: 5.0 Setpoint: 5.0	Camera 2 Information Exposing Light X Err: 0.0, Y Err: 0.50 Cooler Regulating Sensor Temp: 20.9 Setpoint: 20.0
--	---	---

opcja Graph pokazuje błędy prowadzenia wykryte w czasie obserwacji w formie wykresu

The screenshot displays the MaxIm DL Pro 6 - Autoguider Image software interface. The main window shows a dark field with a small bright star. A 'Tracking Error Graph' window is open, displaying two line graphs for X Error and Y Error over time. The X Error graph shows a peak at 0.00, and the Y Error graph shows a peak at 0.50. A 'Camera Control' window is also open, showing various settings and status information for two cameras.

**Tracking Error Graph (from 00.0...)**

X Error

Y Error

X Peak 0.00 RMS N/A Y Peak 0.50 RMS N/A

**Camera Control**

Expose Guide Setup

Seconds Filter Wheel Scope Dec

1 No Filters 11

Expose Calibrate Start

Track Stop

Auto Scope Dec:  Guide Star: X 12.0 Y 163.0 Reading CCD camera X Er: 0.00, Y Er: 0.05

Auto Pier Flip:  Pier Flip Aggressiveness X 0 Y 0 Graph Options

Whisk Star:  Whisk Star

Camera 1:  Camera 1 Settings Move Alarms Less <<

Camera 2:  Camera 2

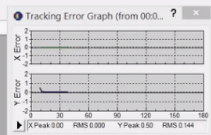
Camera 1 Information: Camera Idle Cooler Regulating Sensor Temp: 5.0 Setpoint: 5.0

Camera 2 Information: Reading CCD camera X Er: 0.00, Y Er: 0.50 X Er: 0.00, Y Er: 0.11 X Er: 0.00, Y Er: 0.05 X Er: 0.00, Y Er: 0.02 Cooler Regulating Sensor Temp: -20.0 Setpoint: 20.0

3D(1)

For Help, press F1

32x32 100%



Camera Control ? x

Expose | Guide | Setup |

Exposure Preset Find Star ▶ 2 Filter moving

Readout Mode Normal - Subframe  On  Mouse

Speed 100 Frame Type Single X 468 Y 346 W: 86 H: 82  Single  Continuous  Autocore

Filter Wheel Luminance X Binning 1 Y Binning Same @ Camera 1  Camera 2

Camera 1 Information	Camera 2 Information
Waiting for filter wheel	Waiting for filter wheel
0 of 5.000 sec	X Err: 0.00 Y Err: 0.02
Filter: Red	X Err: 0.00 Y Err: 0.02
Cooler: Regulating	X Err: 0.00 Y Err: 0.02
Sensor Temp: 5.0	X Err: 0.00 Y Err: 0.02
Setpoint: 5.0	X Err: 0.00 Y Err: 0.02
Max: 20.00	X Err: 0.00 Y Err: 0.02
Image: 1 of 3	X Err: 0.00 Y Err: 0.02
Elapsed: 1 of 30 sec	X Err: 0.00 Y Err: 0.02

wracamy do zakładki **Expose** aby wykonać właściwą sekwencję zdjęć, jednocześnie w tle wykonują się zdjęcia kontrolne, a wykres błędów jest uzupełniany o kolejne punkty

The screenshot displays the Maxm DL Pro 6 software interface for camera control. The main window title is "Maxm DL Pro 6 - M36\_-001R.fit". The menu bar includes "File", "Edit", "View", "Analyze", "Process", "Filter", "Color", "Plug-in", "Window", and "Help". The toolbar shows various icons for file operations and zooming, with a zoom level of 34.4%.

On the left, there is an "Autoguider Image" window showing a dark field with a few bright stars. Below it is a smaller window titled "M36\_-001R..." showing a similar view.

In the top right, a "Tracking Error Graph (from 00:0...)" window displays two line graphs. The top graph is labeled "X Error" and the bottom graph is labeled "Y Error". Both graphs show error values over time, with the X-axis ranging from 0 to 180. The Y-axis for both ranges from -3 to 2. Below the graphs, statistics are shown: "X Peak 0.00", "RMS 0.000", "Y Peak 0.50", and "RMS 0.021".

The main "Camera Control" window is divided into several sections:

- Expose | Guide | Setup**: Includes "Exposure Preset" (Find Star), "Readout Mode" (Normal), "Speed" (100), "Frame Type" (light), and "Filter Wheel" (Lumance).
- Seconds**: Set to 2, with a "Filter moving" indicator and a "Start" button.
- Subframe**: Includes "On" and "Mouse" checkboxes, and "Single", "Continuous", and "Autocare" radio buttons.
- Options**: Includes "X Binning" (1), "Y Binning" (Same), and "Camera 1" / "Camera 2" selection.
- Camera Information**: Two columns of status information for Camera 1 and Camera 2. Camera 1 is "Waiting for filter wheel" (2 of 5:00 sec), "Filter Green", "Cooler Regulating", "Sensor Temp 5.0", "Support 5.0", "M36\_-001G", "Image 2 of 3", and "Elapsed 16 of 30 sec". Camera 2 is also "Waiting for filter wheel".

At the bottom left, it says "For Help, press F1". At the bottom right, it shows "768x511" and "34%".

# Redukcja obrazów

## przykładowa klatka kalibracyjna typu bias

The screenshot displays the Madm DL Pro 5 software interface. The main window, titled "bias\_n10\_002", shows a dark gray area. In the bottom right corner, there are two panels:

- Screen Stretch**: A panel showing a histogram of pixel intensities. The x-axis is labeled "Minimum" and "Maximum". The values are 0 and 271.69. There is an "Updates" button.
- Information**: A panel listing various image statistics:
  - Cursor
  - Pixel
  - Maximum
  - Minimum
  - Median
  - Average
  - Std Dev
  - Centroid
  - FWHM
  - Mode: Aperture
  - Display in Arcsec
  - Calibrate >>
  - Magnitude
  - Intensity
  - SNR
  - Eqd Avg
  - Eqd Dev
  - Flatness

The bottom status bar shows "1530x1020 52%".

otwieramy klatkę obrazu pola

The screenshot displays a Mac OS X desktop environment. The primary window is a file browser titled "Mac OS X DL Pro 5 - bias\_n10\_002" with the path "images > HUGHES > 071207\_08\_rvo". The file list contains the following entries:

Name	Date modified	Type	Size
process	12/3/2011 10:37 AM	File folder	
ngc6811	7/13/2007 9:37 AM	Mac OS DL Image	6,304 KB
ngc6819	7/13/2007 9:37 AM	Mac OS DL Image	6,304 KB
pelican_ha_Smin_1	7/12/2007 10:19 PM	Mac OS DL Image	3,055 KB
pelican_ha_Smin_2	7/12/2007 10:24 PM	Mac OS DL Image	3,055 KB
pelican_ha_Smin_3	7/12/2007 10:30 PM	Mac OS DL Image	3,055 KB
pelican_ha_Smin_4	7/12/2007 10:35 PM	Mac OS DL Image	3,055 KB
pelican_ha_Smin_5	7/12/2007 10:40 PM	Mac OS DL Image	3,055 KB
pelican_ha_Smin_6	7/12/2007 10:46 PM	Mac OS DL Image	3,055 KB
pelican_ha_Smin_7	7/12/2007 10:51 PM	Mac OS DL Image	3,055 KB
pelican_ha_Smin_8	7/12/2007 10:57 PM	Mac OS DL Image	3,055 KB
pelican_ha_Smin_9	7/12/2007 11:02 PM	Mac OS DL Image	3,055 KB
pelican_ha_Smin_10	7/12/2007 11:08 PM	Mac OS DL Image	3,055 KB
pelican_ha_Smin_11	7/12/2007 11:13 PM	Mac OS DL Image	3,055 KB
pelican_ha_Smin_12	7/12/2007 11:18 PM	Mac OS DL Image	3,055 KB
pelican_ha_Smin_13	7/13/2007 12:40 AM	Mac OS DL Image	3,055 KB
pelican_ha_Smin_14	7/13/2007 12:45 AM	Mac OS DL Image	3,055 KB
pelican_ha_Smin_15	7/13/2007 12:51 AM	Mac OS DL Image	3,055 KB
pelican_ha_Smin_16	7/13/2007 1:56 AM	Mac OS DL Image	3,055 KB

Below the file list, the "File name" field is empty, and the "File format" is set to "Auto". The "Open" button is highlighted. In the background, a "Screen Stretch" utility window is visible, showing a histogram of the selected image with a white peak on a black background. The histogram has "Minimum" at 0 and "Maximum" at 271.69. To the right, an "Information" panel displays the following statistics:

Property	Value
Cursor	
Pixel	
Maximum	Magnitude
Minimum	Intensity
Median	SHR
Average	Egpt Avg
Std Dev	Egpt Dev
Centred	
FWHM	Fitnes

At the bottom of the screen, the status bar shows "For Help, press F1" on the left and "1530x1020 52%" on the right.



klatka jest wyraźnie zaszumiona

The screenshot shows the MaxDL Pro 5 software interface. The main window displays a dark astronomical image with a central star cluster. A green cursor is positioned over a star. Two floating windows are visible: 'Screen Sketch' and 'Information'.

**Screen Sketch**

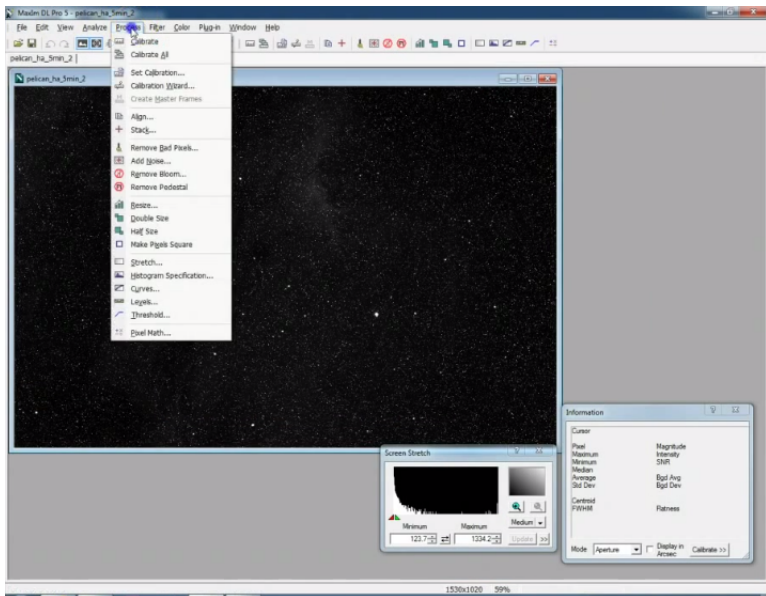
Minimum	Maximum
123.7	1234.2

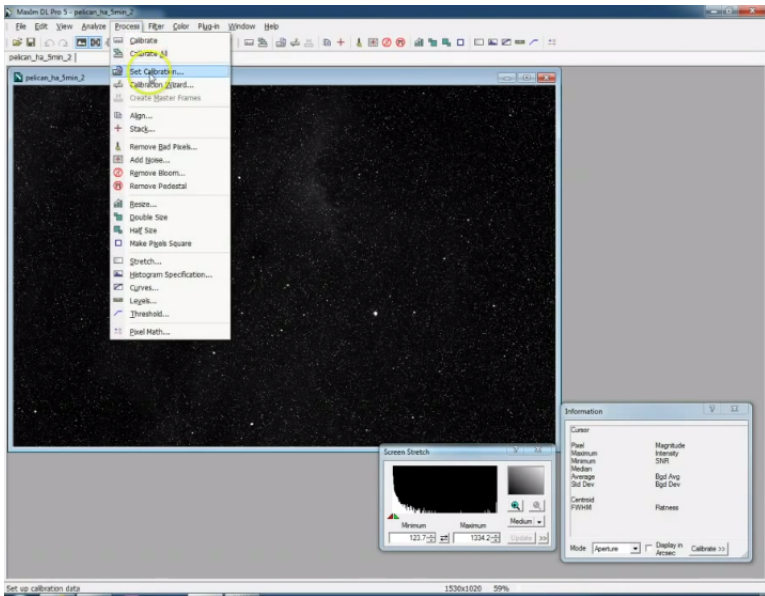
**Information**

Pixel	149,000	Magnitude	
Maximum	1150,000	Intensity	0,000
Minimum	140,000	SNR	0,000
Median	166,000		
Average	190,697	Eqd Avg	240,163
Std Dev	107,104	Eqd Dev	480,050
Centred	(X= 558,000, Y= 247,000)	Flatness	
FWHM			

Mode: Aperture  Display in Arcsec  Calibrate >>

w rozwijanym menu Process znajdujemy opcję Set Calibration





doujemy grupę klatek kalibracyjnych tego samego typu

The screenshot shows the 'Set Calibration' dialog box in MaxIm DL Pro 5. The dialog is titled 'Set Calibration' and has a 'Generate Groups' checkbox checked. The 'Source Folder' is set to 'C:\Users\ghackiev\Desktop\images\HUGHES-671207\_atl\_rno\process'. Below this, there are buttons for 'Auto Generate (Clear Old)', 'Replace w/ Masters', 'OK', 'Cancel', and 'Advanced'. The 'Calibration Groups' section contains a table with columns: Name, Type, Filter, Duration, Image Size, Binning, Setpoint, and Count. Below the table are buttons for 'DAFK', 'Add Group', 'Remove Group', and 'Clear All Groups'. The 'Remove Group' button is circled in yellow. The 'Group Properties' section includes a 'File Name' field, a 'Dark Frame Scaling' dropdown set to 'Auto-Scale', a 'Scale Factor' of 1.0000, a 'Combine Type' dropdown set to 'Average', a 'Bad Pixel Map' dropdown set to '<NONE>', and an 'Apply To All Groups' checkbox checked. At the bottom, there are checkboxes for 'Show File Names Only' and 'Apply Source Filter (one-shot color field)'. The background shows a dark astronomical image with a histogram overlay. The histogram has 'Minimum' at 123.7 and 'Maximum' at 1234.2. The status bar at the bottom shows '1530x1020 39%'.

typ dodanej grupy wybieramy z rozwijanej listy

The screenshot shows a software window titled "Madm DL Pro 5 - pelcan\_ha\_3min\_2". The main area displays a dark image of a star field. A "Set Calibration" dialog box is open, showing the following details:

- Source Folder: C:\Users\glackie\F\Desktop\images\HUGHES-071207\_atl\_rn\process\
- Auto Generate (Clear Old) [button] Replace w/ Masters [button]
- Calibration Groups table:

Name	Type	Filter	Duration	Image Size	Binning	Setpoint	Count
Dark 1	DARK		0.00s	9 x 9	N/A	N/A	0

Below the table, a dropdown menu shows "DARK" and an "Add Group" button. Other buttons include "Remove Group" and "Clear All Groups".

Group Properties section:

- File Name: [empty field]
- Dark Frame Scaling: Auto-Scale
- Scale Factor: 1.0000
- Combine Type: Average
- Bad Pixel Map: <NONE>
- Buttons: Add, Remove
- Apply To All Groups: [checked]

Fit statistics panel (partially visible):

- Minimum: 123.7
- Maximum: 1234.2
- Update [button]

Fit panel (partially visible):

- Mode: Aperture
- Display in Arcsec: [checkbox]
- Calibrate [button]

tworzymy dwie grupy - klatak typu dark i typu bias

MaxIm DL Pro 5 - pelcan\_ha\_3min\_2

File Edit View Analyze Process Filter Color Plugins Window Help

pelcan\_ha\_3min\_2 |

pelcan\_ha\_3min\_2

Set Calibration

Automatically Generate Groups

Source Folder  
C:\Users\glackie\F\Desktop\images\HUGHES-071207\_atl\_rn\process\

Auto-Generate (Clear Old) Replace w/ Masters

OK Cancel Advanced

Calibration Groups

Name	Type	Filter	Duration	Image Size	Binning	Setpoint	Count
Dark 1	DARK		0.00s	9 x 9	N/A	N/A	0

DARK BIAS BIAS FLAT <AUTO>

Add Group Remove Group Clear All Groups

Dark Frame Scaling  
Auto-Scale

Scale Factor 1.0000

Combine Type Average Settings

Bad Pixel Map <NONE>

Add Remove

Apply To All Groups

Show File Names Only Apply Source Filter (one-shot color field)

Minimum Maximum Medium

123.7 1234.2 Update

Centred FWHM Fitness

Mode Aperture Display in Arcsec Calibrate >>

For Help, press F1 1530x1020 39%

potrzebne są podstawowe informacje o klatkach jak czas ekspozycji, rozmiar, binowanie

The screenshot shows the 'Set Calibration' dialog box in MaxIm DL Pro 5. The dialog box is used for configuring calibration groups for astronomical images. It includes a table for 'Calibration Groups' with columns for Name, Type, Filter, Duration, Image Size, Binning, Setpoint, and Count. The 'Add Group' button is highlighted with a yellow circle.

Source Folder: C:\Users\ghackiev\Desktop\images\HUGHES-071207\_atl\_rn\process\

Name	Type	Filter	Duration	Image Size	Binning	Setpoint	Count
Dark 1	DARK		0.00s	9 x 9	N/A	N/A	0

Buttons: Add Group, Remove Group, Clear All Groups

Group Properties: File Name, Dark Frame Scaling (Auto-Scale), Scale Factor (1.0000), Combine Type (Average), Bad Pixel Map (<NONE>), Add, Remove, Apply To All Groups

Minimum: 123.7, Maximum: 1234.2, Medium: Medium, Update

Mode: Aperture, Display in Arcsec, Calibrate

wypełniamy grupę Dark klatkami o tych samych parametrach aby później je uśrednić

The screenshot displays the 'Set Calibration' dialog box in MaxIm DL Pro 5. The 'Source Folder' is set to 'C:\Users\blackie\F\Desktop\images\HUGHES-071207\_atE\_m0\process\'. The 'Calibration Groups' table is as follows:

Name	Type	Filter	Duration	Image Size	Binning	Setpoint	Count
Dark 1	DARK		0:00	0 x 0	N/A	N/A	0
Bias 1	Bias		N/A	0 x 0	N/A	N/A	0

The 'Filter' column for the 'Bias 1' row is highlighted with a yellow circle. Below the table, the 'Group Properties' section shows 'File Name' and 'Dark Frame Scaling' options. The 'Apply To All Groups' checkbox is checked. At the bottom, a histogram shows 'Minimum' at 123.7 and 'Maximum' at 1334.2.



Maxim DL Pro 5 - pelican\_ha\_5min\_2

File Edit View Analyze Process Filter Color Plugins Window Help

pelican\_ha\_5min\_2

pelican\_ha\_5min\_2

Set Calibration

Automatically Generate Groups

Source Folder  
C:\Users\ghackiv\F\Desktop\images\HUGHES-071207\_atE\_no\process\

Auto Generate (Clear Old) Replace w/ Masters

Advanced

OK  
Cancel

Calibration Groups

Name	Type	Filter	Duration	Image Size	Binning	Setpoint	Count
<input checked="" type="checkbox"/> Dark 1	DARK		0.06s	0 x 0	N/A	N/A	0
<input checked="" type="checkbox"/> Bias 1	BIAS		N/A	0 x 0	N/A	N/A	0

BIAS Add Group Remove Group Clear All Groups

Group Properties

File Name

Dark Frame Scaling  
Auto-Scale

Scale Factor 1.0000

Combine Type  
Average Settings

Bad Pixel Map  
None

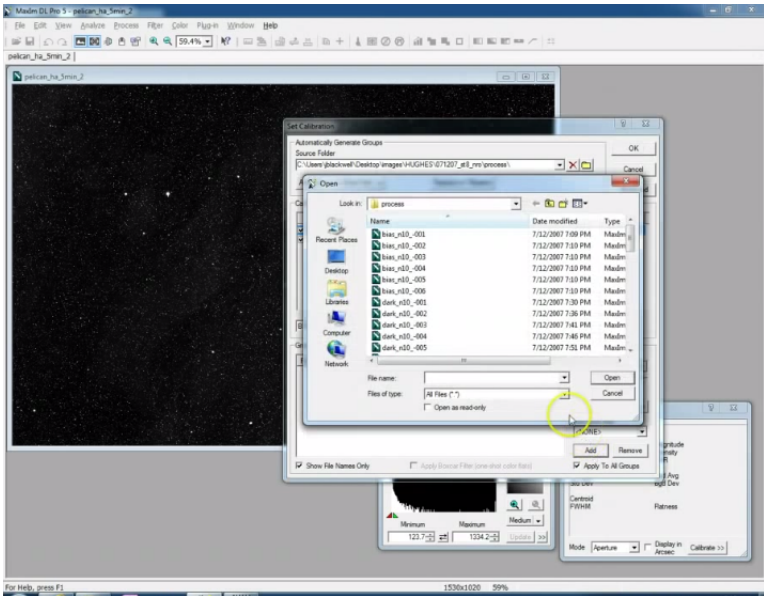
Add Remove  
Apply To All Groups

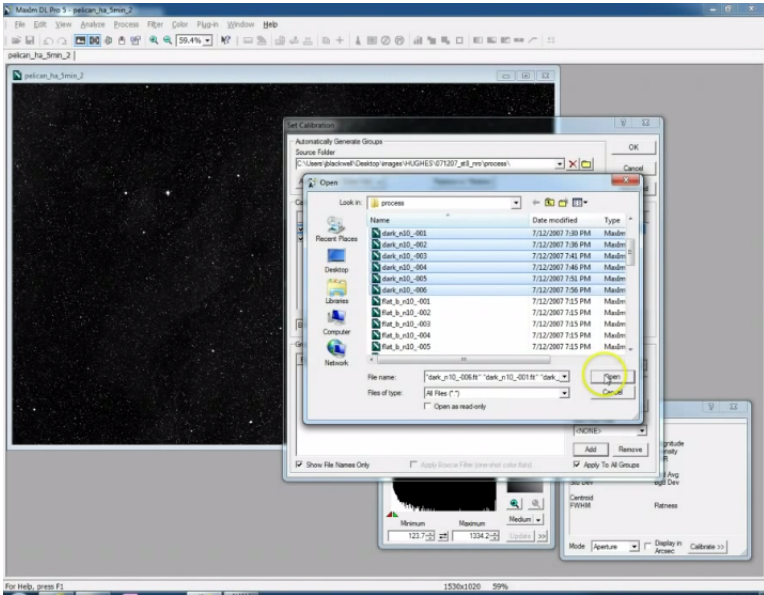
Show File Names Only  Apply Source Filter (one-shot color field)

Minimum Maximum Medium  
123.7 1334.2 Update

Centroid FWHM Fitness  
Mode Aperture Display in Arcsec Calibrate

For Help, press F1 1530x1020 39%





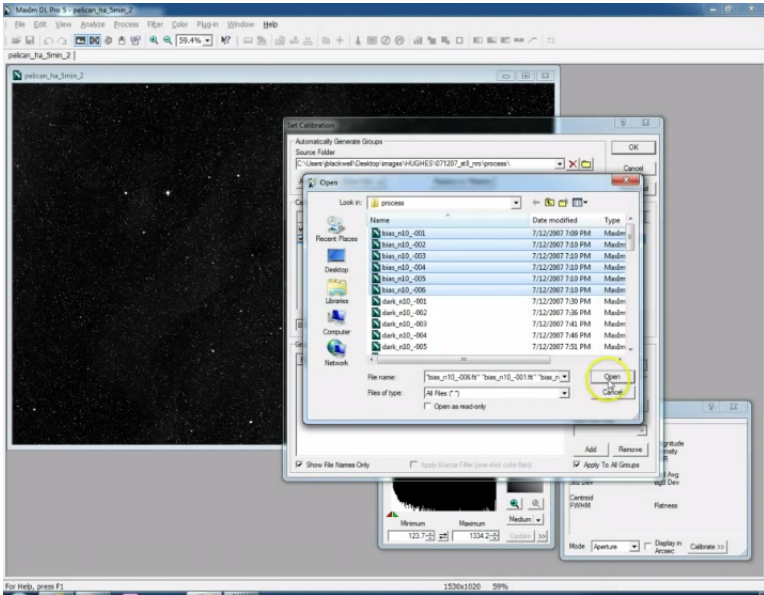
## wypełniamy grupę Bias w podobny sposób

The screenshot shows the 'Set Calibration' dialog box in MaxIm DL Pro 5. The 'Source Folder' is set to 'C:\Users\blackwell\Desktop\images\HUGHES-071207\_atl\_rno\process\'. The 'Calibration Groups' table is as follows:

Name	Type	Filter	Duration	Image Size	Binning	Setpoint	Count
<input checked="" type="checkbox"/>	DARK		300.00s	1530 x 1020	1 x 1	-10.00	6
<input checked="" type="checkbox"/>	Bias		N/A	0 x 0	N/A	N/A	0

The 'Group Properties' section shows the 'File Name' field is empty. The 'Add' button in the 'Group Properties' section is highlighted with a yellow circle. The 'Apply to All Groups' checkbox is checked.

At the bottom of the dialog, there is a 'Minimum' field with the value 123.7 and a 'Maximum' field with the value 1234.2. The 'Mode' is set to 'Aperture' and 'Display in Arcsec' is checked.



The screenshot shows the MaxDL Pro 5 software interface. The main window displays a dark field image of a starry sky. A 'Set Calibration' dialog box is open in the foreground, allowing the user to configure calibration groups. The dialog includes a 'Source Folder' field, an 'Auto-Generate' dropdown, and a table of 'Calibration Groups'. The 'BAS' group is selected. Below the table, there are 'Group Properties' and 'Dark Frame Scaling' options.

**Set Calibration**

Automatically Generate Groups

Source Folder  
 C:\Users\gblackw\Desktop\images\HUGHES-671207\_atE\_m0\process\

Auto-Generate Clear Old Replace w/ Masters Advanced

Calibration Groups

Name	Type	Filter	Duration	Image Size	Binning	Setpoint	Count
<input checked="" type="checkbox"/> Dark 1	DARK		300.00s	1530 x 1020	1 x 1	-10.00	6
<input checked="" type="checkbox"/> Bias 1	BAS		N/A	1530 x 1020	1 x 1	-10.00	6

BAS Add Group Remove Group Clear All Groups

Group Properties

File Name  
 bias\_n10\_-001.fit  
 bias\_n10\_-002.fit  
 bias\_n10\_-003.fit  
 bias\_n10\_-004.fit  
 bias\_n10\_-005.fit  
 bias\_n10\_-006.fit

Show File Names Only  Apply Bias as Filter (one-shot color band)

Dark Frame Scaling  
 Auto-Scale  
 Scale Factor 1.0000  
 Combine Type Average Settings  
 Bad Pixel Map  
 Add Remove  
 Apply To All Groups

Minimum Maximum Medium  
 123.7 1334.2 Update

Centred FITS Flatness  
 Mode Aperture Display in Arcsec Calibrate >>

For Help, press F1 1530x1020 99%

z menu Process wybieramy Calibrate aby uruchomić process redukcji

The screenshot shows the MaxIm DL Pro 5 software interface. The main window displays a dark astronomical image of a star field. The 'Process' menu is open, and the 'Calibrate' option is highlighted. Below the main window, there are two smaller windows: 'Screen Stretch' and 'Information'.

**Process Menu:**

- Calibrate
- Calibrate All
- Set Calibration...
- Calibration Wizard...
- Create Master Frames
- Align...
- Stack...
- Remove Bad Pixels...
- Add Noise...
- Remove Bloom...
- Remove Pedestal
- Resize...
- Double Size
- Half Size
- Make Pixels Square
- Stretch...
- Histogram Specification...
- Curves...
- Layers...
- Threshold...
- Pixel Math...

**Screen Stretch Window:**

Minimum: 123.7 Maximum: 1234.2 Medium

**Information Window:**

Pixel	Magnitude
Maximum	Intensity
Minimum	SNR
Median	Eqpt Avg
Average	Eqpt Dev
Std Dev	Flatness
Centroid	
FWHM	

Mode: Aperture Display in Arcsec Calibrate >>

zdjęcie jest wyraźnie odszumione

The screenshot displays the MaxDL Pro 5 software interface. The main window shows a dark astronomical image with a green circle highlighting a star. The software has a menu bar (File, Edit, View, Analyze, Process, Filter, Color, Plugin, Window, Help) and a toolbar. The status bar at the bottom indicates the image size is 1530x1020 pixels, zoomed to 99%, with a cursor at (799, 326) and a value of 155.647.

**Information Panel:**

Cursor	
(X= 708, Y= 326)	Rad= 10, Rad2= 22
Pixel	155.647
Maximum	187.567
Minimum	113.567
Median	157.667
Average	158.415
Std Dev	10.671
Centred	(X= 708.000, Y= 326.000)
FWHM	Flatness
Intensity	0.000
SNR	0.000
Bptl Avg	165.458
Bptl Dev	11.891

**Screen Sketch Panel:**

Minimum: 94.954 | Maximum: 1171.2 | Medium: [dropdown]

Buttons: Update, [icon]



można zmienić kontrast aby zobaczyć szczegóły

The screenshot displays the MaxDL Pro 5 software interface. The main window shows a grayscale image of a star field with a prominent nebula. The software's menu bar includes File, Edit, View, Analyze, Process, Filter, Color, Plugin, Window, and Help. The toolbar contains various icons for file operations, zooming, and analysis. The main image area is titled 'pelican\_ha\_5min\_2'. A 'Screen Stretch' histogram is overlaid on the bottom right of the image, showing a curve that rises sharply and then levels off. The histogram has 'Minimum' and 'Maximum' labels with corresponding values: 94.954 and 331.82. An 'Information' panel is also visible on the right side of the interface, displaying various statistical data for the selected area.

Information	
Cursor	
Pixel	Magnitude
Maximum	Intensity
Minimum	SNR
Median	
Average	Eqd Avg
Std Dev	Eqd Dev
Centroid	
FWHM	Flatness
Mode	Aperture
	<input type="checkbox"/> Display in Arcsec
	Calibrate >>

## przykładowa klatka typu Flat

The screenshot displays a software application window titled "MaxIm DL Pro 5 - flat\_Ha\_n10\_001". The main window shows a dark, flat-field image. A yellow circle highlights the window control buttons (minimize, maximize, close) in the top right corner of the image window. Two smaller windows are open: "Screen Stretch" and "Information".

The "Screen Stretch" window shows a histogram of the image data. The x-axis is labeled "Minimum" and "Maximum" with values 19024 and 32991. The y-axis represents intensity. A white peak is visible on the right side of the histogram. The "Manual" button is highlighted.

The "Information" window displays the following data:

Information	
Cursor	
Pixel	Magnitude
Maximum	Intensity
Minimum	SNR
Median	Bg1/ Avg
Average	Bg1/ Dev
Std Dev	
Centroid	Flatness
FWHM	
Mode	Aperture
	<input type="checkbox"/> Display in Arcsec
	Calibrate >>

At the bottom of the application window, the status bar shows "For Help, press F1", "1530x1020", and "59%".

dojemy do zestawu klatek kalibracyjnych użytych wcześniej grupę klatek typu Flat

The screenshot shows the MaxIm DL Pro 5 software interface. The 'Process' menu is open, and 'Set Calibration...' is highlighted. The main window displays a dark image with a calibration target. Two floating windows are visible: 'Screen Stretch' and 'Information'.

**Process Menu:**

- Calibrate
- Calibrate All
- Set Calibration...**
- Calibration Wizard...
- Create Master Frames
- Align...
- Stack...
- Remove Bad Pixels...
- Add Noise...
- Remove Bloom...
- Remove Pedestal
- Resize...
- Double Size
- Half Size
- Make Pixels Square
- Stretch...
- Histogram Specification...
- Curves...
- Layers...
- Threshold...
- Pixel Math...

**Screen Stretch Window:**

Minimum Maximum Low

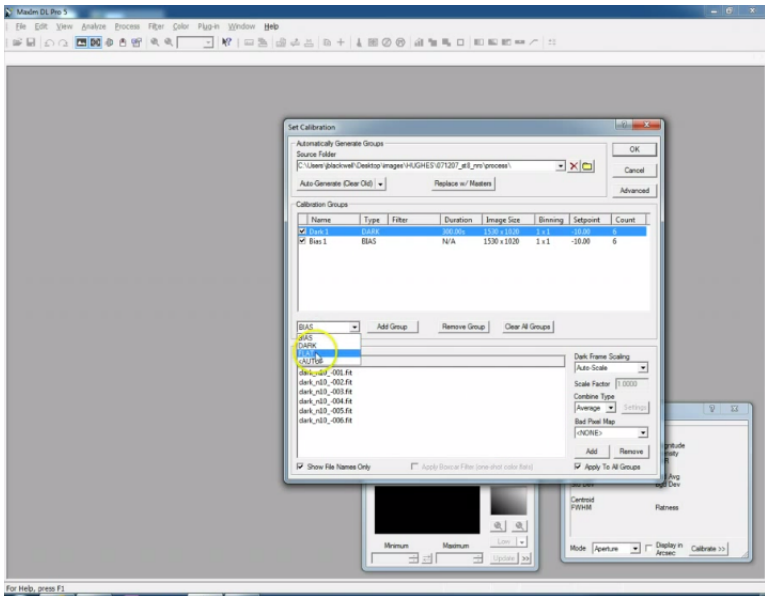
Update

**Information Window:**

Pixel	Magnitude
Maximum	Intensity
Minimum	SNR
Median	Eqd Avg
Average	Eqd Dev
Std Dev	Flatness
Centroid	
FWHM	

Mode Aperture  Display in Arcsec Calibrate >>

Set up calibration data



Set Calibration

Automatically Generate Groups

Source Folder  
C:\Users\ghacknef\Desktop\images\HUGHES-071207\_atl\_fm\process\

Auto Generate (Clear Old) Replace w/ Masters

OK  
Cancel  
Advanced

Calibration Groups

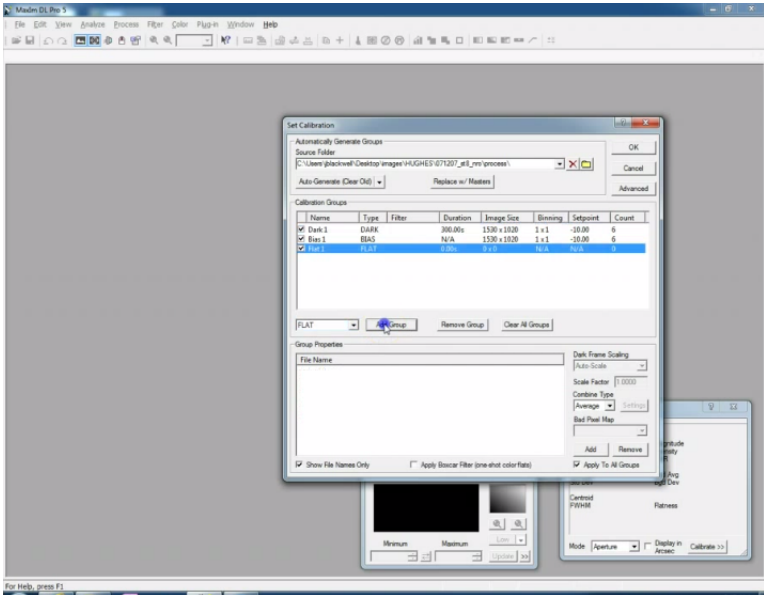
Name	Type	Filter	Duration	Image Size	Binning	Setpoint	Count
Dark 1	DARK		305.00s	1530 x 1020	1 x 1	-10.00	6
Bias 1	BIAS		N/A	1530 x 1020	1 x 1	-10.00	6

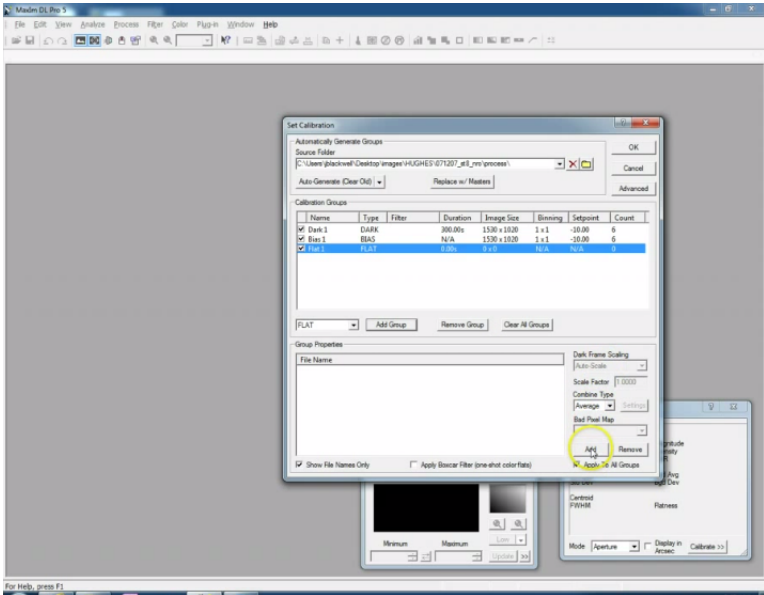
BIAS  
DARK  
-AUTO  
dark\_n0\_001.Ft  
dark\_n0\_002.Ft  
dark\_n0\_003.Ft  
dark\_n0\_004.Ft  
dark\_n0\_005.Ft  
dark\_n0\_006.Ft

Dark Frame Scaling  
Auto Scale  
Scale Factor 1.0000  
Combine Type Average  
Bad Pixel Map <NONE>  
Add Remove  
Apply To All Groups

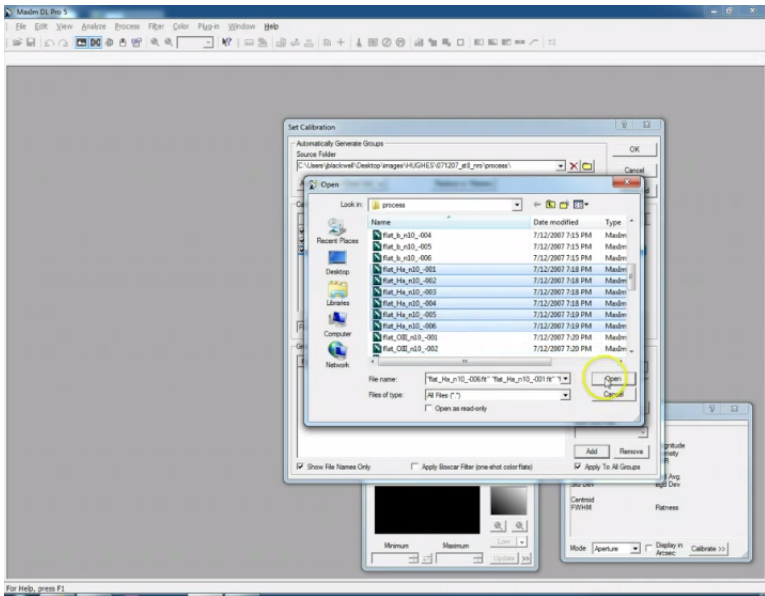
Show File Names Only Apply Bias as Filter (one-shot color field)

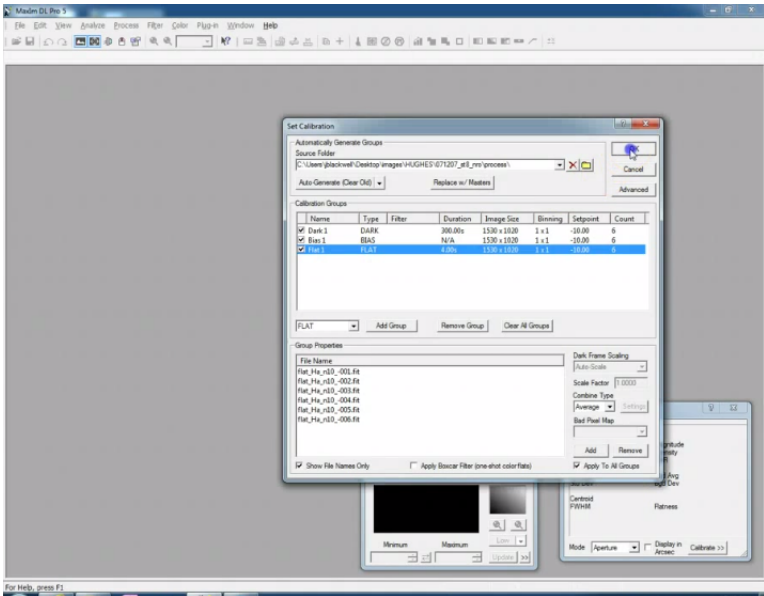
For Help, press F1





uważamy aby wybrać klatki Flat wykonane z tym samym filtrem co klatki redukowane

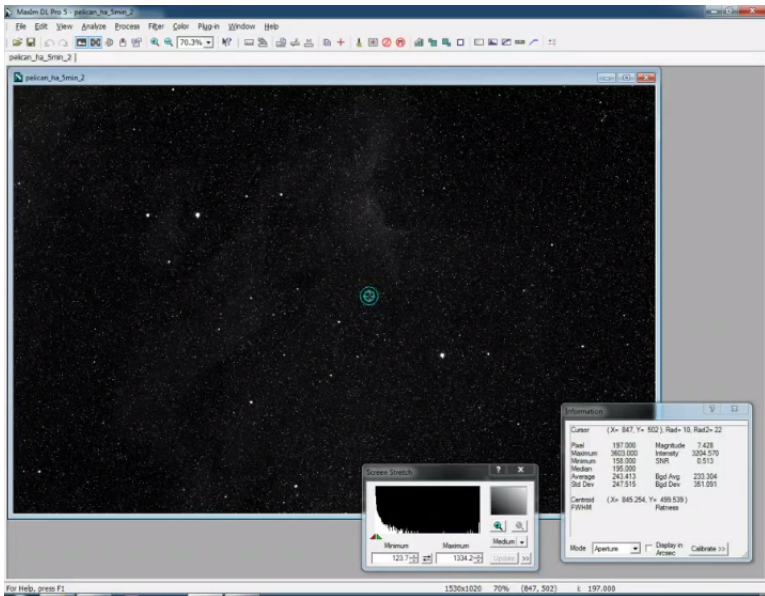




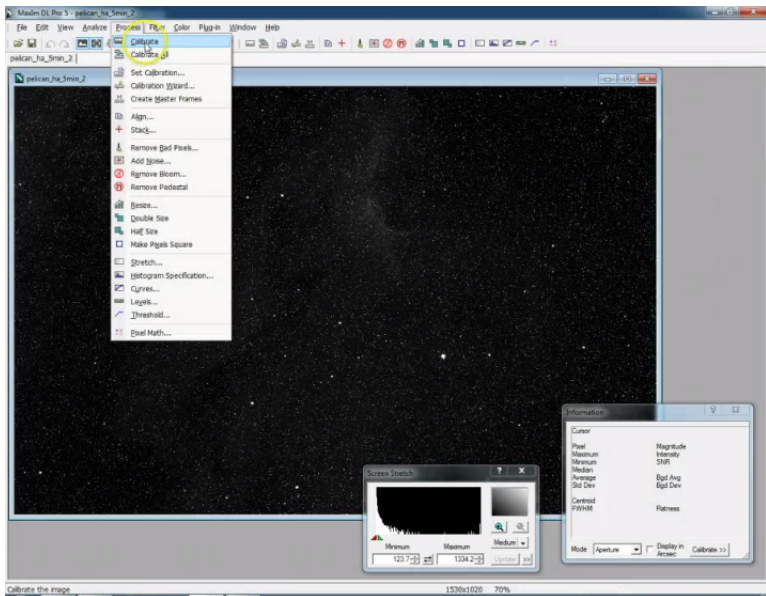
For Help, press F1



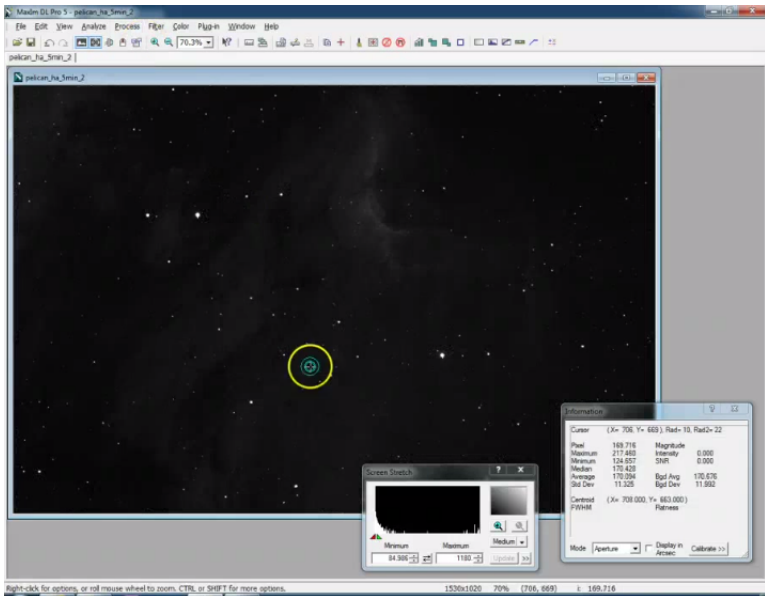
# ponownie wybieramy surowy obraz



i wykorzystujemy opcję Calibrate tym razem wykorzystując klatki typu Bias, Dark i Flat



# przepracowane zdjęcie po pozbyciu się nieporządných efektów kamery i teleskopu

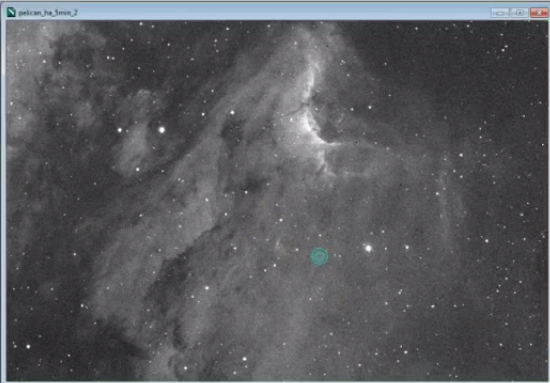


## tutaj z poprawionym kontrastem

Maxim DL Pro 5 - pelican\_ha\_5min\_2

File Edit View Analyze Process Filter Color Plug-in Window Help

pelican\_ha\_5min\_2 | 39.4%

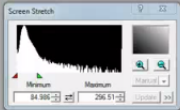


Information

Cursor:	(X= 884, Y= 665) Rad= 10, Rad2= 22		
Pixel	189,196	Magnitude	5.080
Maximum	227,181	Intensity	659,919
Minimum	141,352	SNR	3.639
Median	175,772		
Average	176,337	Eqd. Avg	174,629
Std Dev	10,664	Eqd. Dev	10,803
Centred	(X= 888.864, Y= 666.268)		
FWHM	12.134	Flatness	0.657

Mode: Aperture  Display in Arcsec  Calibrate >>

Screen Stretch



Minimum Maximum Manual

84,985 296,51 Update

Right-click for options, or rol mouse wheel to zoom, CTRL, or SHIFT for more options.

1530x1020 39% (884, 665) 189,196

# Fotometria

przykładowe zdjęcie pola gwiazdy SS Cyg, jasność można zmierzyć gdy zdjęcie lub seria zdjęć są otworzone i można je podejrzeć

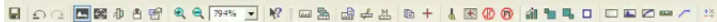
The image shows a screenshot of the MaxDL Pro 5 software interface. The main window displays a star field with a yellow circle highlighting a specific star. A 'Screen Stretch' dialog box is open in the bottom right corner, showing a histogram and numerical values for 'Minimum' (186.61) and 'Maximum' (447.46). The software title bar reads 'MaxDL Pro 5 - SS CYG-5003-R007-C001-V.fts'. The menu bar includes 'Edit', 'View', 'Analyze', 'Process', 'Filter', 'Color', 'Plugin', 'Window', and 'Help'. The toolbar contains various icons for file operations, zooming, and analysis. The status bar at the bottom shows the file name 'SS CYG-5003-R007-C001-V.fts' and a zoom level of '100%'. At the bottom right of the image, there are navigation icons for back, forward, and search.

powiększamy wybrany obszar aby przyrzeć się profilom gwiazd

The screenshot displays the MaxIm DL Pro 5 software interface. The main window shows a dark field of stars, with one star in the center highlighted by a yellow circle. A mouse cursor is positioned over this star. The 'Screen Stretch' dialog box is open in the upper right corner, showing a histogram of the selected star's profile. The dialog box includes a 'Minimum' value of 186.61 and a 'Maximum' value of 447.46, with an 'Update' button. The software's menu bar includes 'Edit', 'View', 'Analyze', 'Process', 'Filter', 'Color', 'Plugin', 'Window', and 'Help'. The toolbar contains various icons for file operations, zooming, and analysis. The status bar at the bottom shows the file name 'SS CYG-5003-R007-C001-V.fts'.

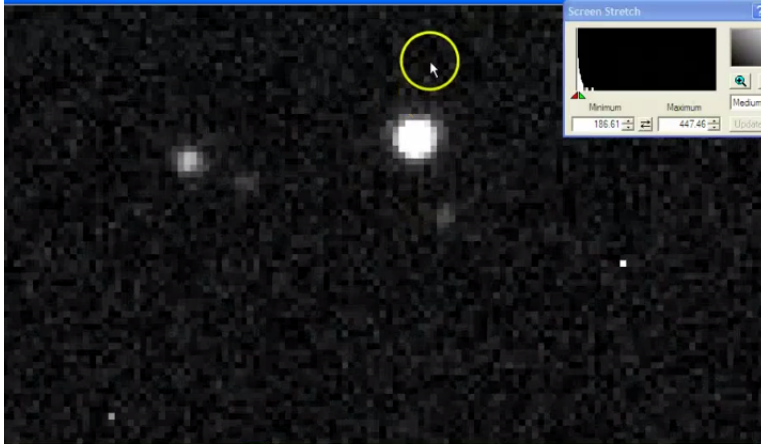
axim DL Pro 5 - SS CYG-5003-R007-C001-V.fts

File Edit View Analyze Process Filter Color Plug-in Window Help



CYG-5003-R002-C001-V.fts | SS CYG-5003-R003-C001-V.fts | SS CYG-5003-R004-C001-V.fts | SS CYG-5003-R005-C001-V.fts | SS CYG-5003-R006-C001-V.fts | SS CYG-5003-R007-C001-V.fts

SS CYG-5003-R007-C001-V.fts



Screen Stretch

Minimum: 186.61    Maximum: 447.46    Update

Medium

The 'Screen Stretch' dialog box shows a histogram of the image's pixel intensities. The x-axis represents intensity values, with the minimum at 186.61 and the maximum at 447.46. The histogram shows a distribution of pixels across this range. The 'Update' button is visible, along with a 'Medium' contrast setting.



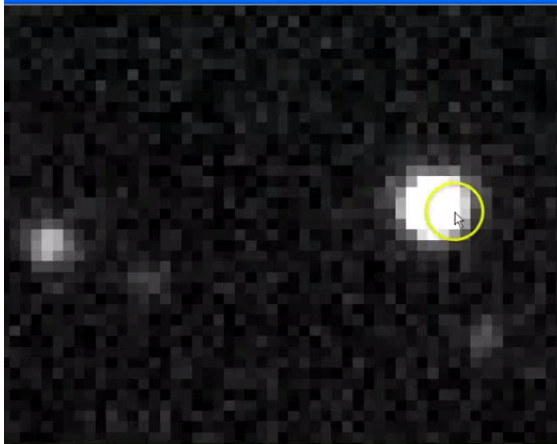
axim DL Pro 5 - SS CYG-5003-R007-C001-V.fts

File Edit View Analyze Process Filter Color Plug-in Window Help



CYG-5003-R002-C001-V.fts | SS CYG-5003-R003-C001-V.fts | SS CYG-5003-R004-C001-V.fts | SS CYG-5003-R005-C001-V.fts | SS CYG-5003-R006-C001-V.fts | SS CYG-5003-R007-C001-V.fts

SS CYG-5003-R007-C001-V.fts

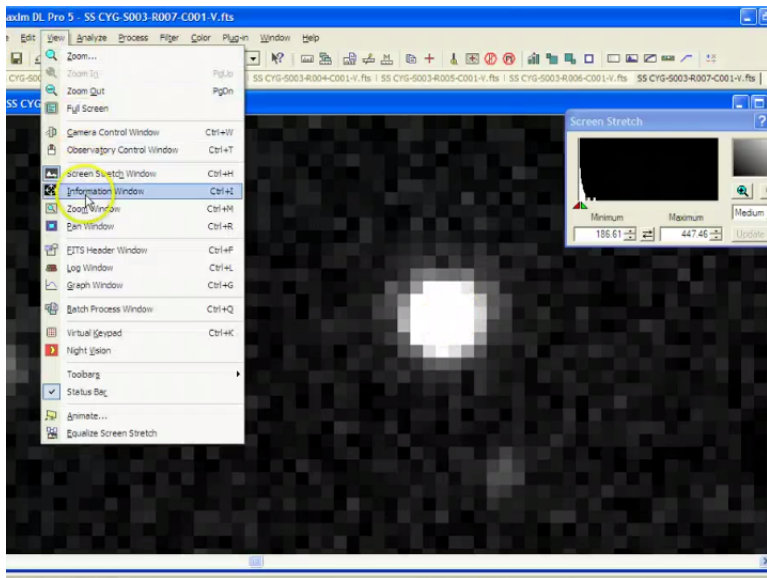


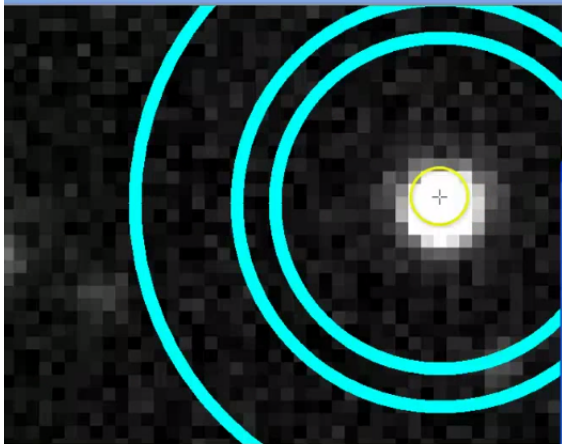
Screen Stretch

Minimum Maximum Medium

186.61 447.46 Update

otwieramy Information Window z zakładki View





### Screen Stretch

Minimum: 186.61  
Maximum: 447.46  
Update

### Information

Cursor (X= 1030, Y= 359, Rad= 13, Rad2= 2)  
21 43 25.45 43 45 35.6

Centroid (1030.124, 359.370)  
21 43 25.44 43 45 35.3 13.112

Image Star  
Catalog Star

Mode: Astrometric

Magnitude Calibration

Intensity: 46870  
Exposure: 45  
Magnitude: 12

Spatial Calibration

Pixel scale X: 10.00  
Y: 10.00

FITS scale available  
Diagonal from Start corner

## ustawiamy pole Mode na Aperture

The screenshot shows the MaxDL Pro 5 software interface. The main window displays a dark image with a bright, circular star-like object in the center. The software's title bar reads "MaxDL Pro 5 - SS CYG-5003-R007-C001-V.fts". The menu bar includes "Edit", "View", "Analyze", "Process", "Filter", "Color", "Plug-in", "Window", and "Help". The toolbar contains various icons for file operations, zooming, and analysis. The status bar at the bottom shows the file name "SS CYG-5003-R007-C001-V.fts".

On the right side, there are two panels:

- Screen Stretch**: This panel shows a histogram of the image data. The "Minimum" value is 186.61 and the "Maximum" value is 447.46. The "Update" button is visible.
- Information**: This panel displays various properties of the selected object. The "Mode" dropdown menu is open, showing options: "Astrometric" (selected), "Aperture", "Region", "Area", and "Astrometric". Other visible fields include "Cursor", "Centroid", "Image Star", and "Catalog Star". There are also buttons for "Extract from image" and "Set from FITS".

At the bottom of the software interface, there are navigation icons for zooming and panning.

pojawia się szereg użytecznych informacji o profilu gwiazdy i jej jasności instrumentalnej

axim DL Pro 5 - SS CYG-5003-R007-C001-V.fts

File Edit View Analyze Process Filter Color Plug-in Window Help

3600%

SS CYG-5003-R007-C001-V.fts

Screen Stretch

Minimum Maximum Medium

186.61 447.46 Update

Information

Cursor (X= 1030, Y= 360), Rad= 13, Rad2= 2

Pixel	1651.126	Magnitude	13.099
Maximum	1718.167	Intensity	22716.238
Minimum	177.603	SNR	81.834
Median	213.463		
Average	245.522	Bgd Avg	206.581
Std Dev	161.688	Bgd Dev	12.069

Centroid (X= 1030.124, Y= 359.370)

FWHM 28.563" Flatness 0.009

Mode Aperture  Display in Arcsec Calibrate

Magnitude Calibration

Intensity 46870 Extract from image

Exposure 45 Set from FITS

Magnitude 12 Apply

Spatial Calibration

Pixel scale X 10.00  FITS scale available

Set Y 10.00 Diagonal from Start corner

aby wyznaczyć jasność rzeczywistą potrzebujemy ustalić gwiazdę porównania o stałej i znanej jasności

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Today: Question #91

December 5  
Today in AAVSO history...

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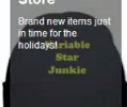

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**Light Curve of the Week**  
  
T CAS  
[What is a light curve?](#)  
[About this star](#)

**New AAVSO Store**  
Brand new items just in time for the holidays!  
  


**Star Finder**  
Star name here  
Type star name then click action.  
[Plot a light curve](#)  
[Check recent observations](#)  
[Create a finder chart](#)  
[Search VSX](#)

dl'a znanych gwiazd zmiennych korzystamy z kreatora mapki AAVSO

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**Light Curve of the Week**

T CAS

- » What is a light curve?
- » About this star
- » Observe this star

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Brand new items just in time for the holidays!

**Star Junkie**

**CAUTION**  
Variable star observing is addictive

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**Star Finder**

Type star name then click action

- » Plot a light curve
- » Check recent observations
- » Create a finder chart
- » Search VSX

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Today: Question #91

December 5  
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T CAS

- » What is a light curve?
- » About this star
- » Observe this star

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### AAVSO Building Dedication

The new HQ was officially dedicated at the 100th annual meeting.



[Read more...](#)

### Star Finder

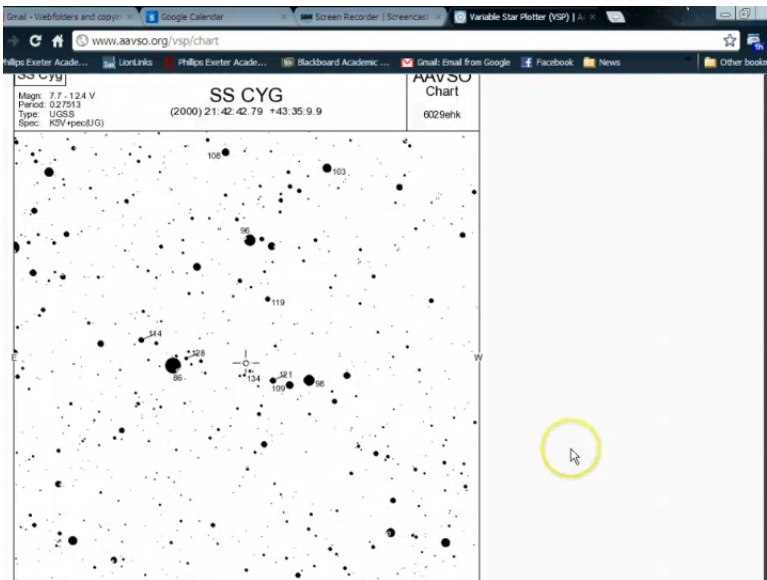
Type star name then click action

- » Plot a light curve
- » Check recent observations
- » [Create a finder chart](#)
- » Search VSX

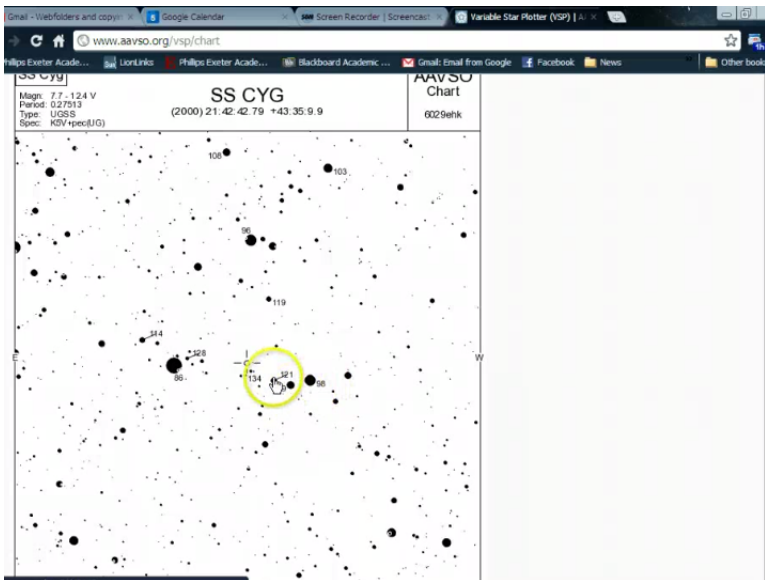
[Learn More](#)



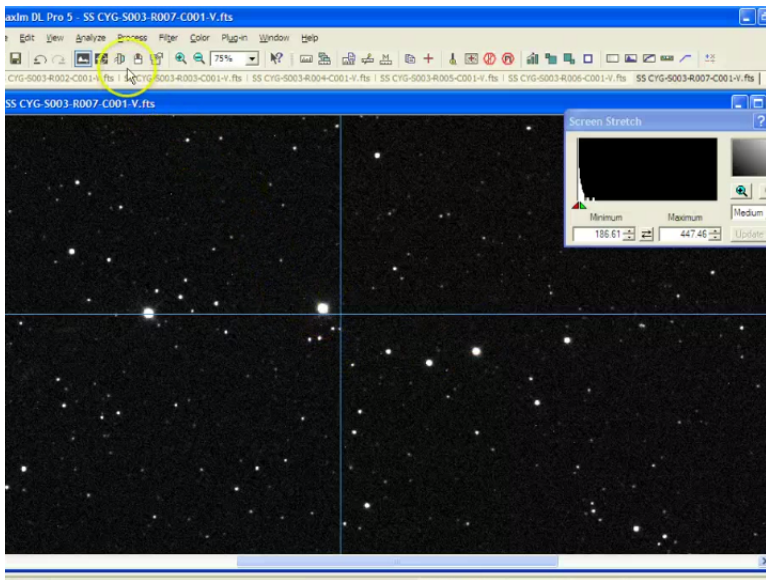
na mapce podane są jasności gwiazd porównania



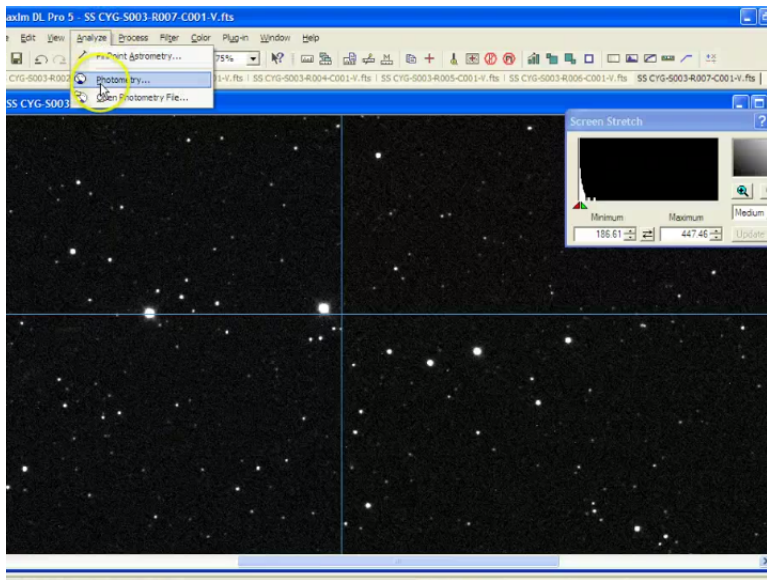
nałyby ustalić położenie tej samej gwiazdy badanej i gwiazdy porównania na mapce i na naszym zdjęciu



gdy się to udało wybieramy menu Analize i Photometry



pojawia się okno z wyszczególnionymi nazwami otwartych obrazów



axim DL Pro 5 - Photometry - SS CYG-5003-R001-C001-V.fits

File Edit View Analyze Process Filter Color Plug-in Window Help

R003-C001-V.fits | SS CYG-5003-R004-C001-V.fits | SS CYG-5003-R005-C001-V.fits | SS CYG-5003-R006-C001-V.fits | SS CYG-5003-R007-C001-V.fits Photometry - SS CYG-5003-R001-C001-V.fits

Photometry - SS CYG-5003-R001-C001-V.fits

Photometry

Image list

- SS CYG-5003-R001
- SS CYG-5003-R000
- SS CYG-5003-R000
- SS CYG-5003-R000
- SS CYG-5003-R000
- SS CYG-5003-R000
- SS CYG-5003-R000
- SS CYG-5003-R000
- SS CYG-5003-R000
- SS CYG-5003-R000
- SS CYG-5003-R011
- SS CYG-5003-R011
- SS CYG-5003-R011

Tagged objects

Time/identification field  
Date/time from FIT

Mouse click tags as:  
(none)

Ref Mag

Exclude Untag

Time of Image (Mid-exp)  
2011-06-30 02:19:31.0  
JD 2455742.596887

Act on all images  
Use star matching  
Snap to centroid

View Plot... Close

Screen Stretch

Minimum Maximum Medium

190.64 502.05 Update

Information

Cursor

Pixel	Magnitude
Maximum	Intensity
Minimum	SNR
Median	Bgd Avg
Average	Bgd Dev
Std Dev	

Centroid Flatness

FWHM

Mode Aperture Display in Arcsec Calibrate

Magnitude Calibration

Intensity 46870 Extract from image

Exposure 45 Set from FITS

Magnitude 12 Apply

Spatial Calibration

Pixel scale X 10.00 FITS scale available

Set Y 10.00 Diagonal from Start corner

## Photometry

## Image list

SS CYG-5003-R00  
 SS CYG-5003-R00  
 SS CYG-5003-R00  
 SS CYG-5003-R00  
 SS CYG-5003-R00  
 SS CYG-5003-R00  
 SS CYG-5003-R00  
 SS CYG-5003-R00  
 SS CYG-5003-R01  
 SS CYG-5003-R01  
 SS CYG-5003-R01

## Tagged objects

(Empty list)

## Time/identification field

Date/time from FIT


Exclude

Untag

## Time of image (Mid-exp.)

2011-06-30 02:27:26.0

JD 2455742.602384

View Plot...

Close

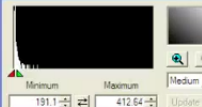
## Mouse click tags as:

(none)

## Ref Mag

 Act on all images Use star matching Snap to centroid

## Screen Stretch



## Information

## Cursor

Pixel	Magnitude
Maximum	Intensity
Minimum	SNR
Median	Bgd Avg
Average	Bgd Dev
Std Dev	
Centroid	Fitness
FWHM	

Mode: Aperture  Display in Arcsec  Calibrate

## Magnitude Calibration

Intensity: 46870

Extract from image

Exposure: 45

Set from FITS

Magnitude: 12

Apply

## Spatial Calibration

Pixel scale X: 10.00

 FITS scale available

Set... Y: 10.00

Diagonal from Start corner

axim DL Pro 5 - Photometry - SS CYG-5003-R020-C001-V.fits

File Edit Analyze Process Filter Color Plug-in Window Help

29.7%

SS CYG-5003-R004-C001-V.fits | SS CYG-5003-R005-C001-V.fits | SS CYG-5003-R006-C001-V.fits | SS CYG-5003-R007-C001-V.fits | Photometry - SS CYG-5003-R020-C001-V.fits

Photometry - SS CYG-5003-R020-C001-V.fits

**Photometry**

Image list Tagged objects

SS CYG-5003-R004  
 SS CYG-5003-R010  
 SS CYG-5003-R011  
 SS CYG-5003-R011  
 SS CYG-5003-R011  
 SS CYG-5003-R011  
 SS CYG-5003-R011  
 SS CYG-5003-R011  
 SS CYG-5003-R011  
 SS CYG-5003-R011  
 SS CYG-5003-R011  
 SS CYG-5003-R011  
 SS CYG-5003-R011  
 SS CYG-5003-R020

Time-identification field  
 Date/time from FIT

Exclude

Time of image (Mid-exp.)  
 2011-06-30 02:49:35.0  
 JD 2455742.617766

View Plot...

Close

Mouse click tags as:  
 (none)

Ref Mag

Act on all images  
 Use star matching  
 Snap to centroid

Un-tag

**Screen Stretch**

Minimum Maximum Medium

173.93 428.26 Update

**Information**

Cursor

Pixel	Magnitude
Maximum	Intensity
Minimum	SNR
Median	
Average	Bgd Avg
Std Dev	Bgd Dev
Centroid	
FWHM	Fitness

Mode Aperture Display in Arcsec Calibrate

Magnitude Calibration

Intensity 46870 Extract from image

Exposure 45 Set from FITS

Magnitude 12 Apply

Spatial Calibration

Pixel scale X 10.00 FITS scale available

Set... Y 10.00 Diagonal from

wybieramy gwiazdę badaną klikając na nią myszką po wcześniejszym wybraniu z listy rodzaju gwiazdy

The screenshot displays the MaxDL Pro 5 software interface with the Photometry tool active. The main window shows a star field image. On the left, the Photometry panel includes an 'Image list' with the selected object 'SS CYG-5003-R001'. Below it, the 'Time/identification field' is set to 'Date/time from FIT', and the 'Time of image (Mid-exp.)' is '2011-06-30 02:19:31.0 JD 2455742.596897'. The 'Mouse click tool as' dropdown is set to '(none)' and is highlighted with a yellow circle. Other options include 'Ref Mag', 'Exclude', 'View Plot...', 'Close', and checkboxes for 'Act on all images', 'Use star matching', and 'Snap to centroid'. On the right, the 'Screen Stretch' panel shows 'Minimum' at 190.64 and 'Maximum' at 502.05. The 'Information' panel displays various metrics for the selected star, including Pixel Maximum (46870), Intensity (45), and Magnitude (12). The 'Mode' is set to 'Aperture' and 'Display in Arcsec' is checked.



## gwiazda badana kryje się pod opcją New Object

The screenshot displays the PixInsight software interface with the 'Photometry' dialog box open. The background shows a star field. The 'Photometry' dialog has several sections:

- Image list:** A list of image files, including 'SS CYG-5003-R001'.
- Tagged objects:** An empty list for objects that have been identified.
- Time/Identification field:** A dropdown menu for 'Data/time from FIT'.
- Mouse click tags as:** A dropdown menu with 'New Object' selected and circled in yellow. Other options include 'None', 'New Moving Object', 'New Reference Star', and 'New Check Star'.
- Act on all images:** A checked checkbox.
- Use star matching:** A checked checkbox.
- Snap to centroid:** A checked checkbox.

Other panels visible in the interface include:

- Screen Stretch:** Shows a histogram and sliders for 'Minimum' (190.64) and 'Maximum' (502.05).
- Information:** Displays various star parameters such as 'Pixel Maximum', 'Magnitude', 'Intensity', 'SNR', 'Median', 'Average', 'Std Dev', 'Bgd Avg', 'Bgd Dev', 'Centroid', 'FWHM', and 'Flatness'.

## klikamy na zdjęcie w miejsce gwiazdy badanej

The screenshot displays the MaxDL Pro 5 Photometry software interface. The main window shows a star field with a central star highlighted by a yellow circle. The software is running on a Windows operating system, as indicated by the taskbar at the bottom.

**Photometry Panel:**

- Image list:** Lists multiple instances of the image file: SS CYG-5003-R001-C001-V.fits.
- Tagged objects:** An empty list for marking objects.
- Time/Identification field:** Shows the date and time from FITS: 2011-06-30 02:19:31.0 JD 2455742.596897.
- Mouse click tags as:** Set to "New Object".
- Ref Mag:** A field for reference magnitude.
- Buttons:** Exclude, Unflag, View Plot..., Close.
- Checkboxes:** Act on all images, Use star matching, Snap to centroid.

**Screen Stretch Panel:**

- Minimum: 190.64
- Maximum: 502.05
- Update button.

**Information Panel:**

- Cursor: (X= 1517, Y= 1013), Rad1= 13, Rad2= 13
- Pixel: 13469.652, Magnitude: 8.792
- Maximum: 63648.887, Intensity: 1.200034e
- Minimum: 217.781, SNR: 3568.869
- Median: 351.572
- Average: 2493.098, Bgd Avg: 224.603
- Std Dev: 8145.561, Bgd Dev: 14.520
- Centroid: (X= 1515.989, Y= 1010.530)
- FWHM: 33.197", Flatness: 0.105

**Mode and Calibration Panels:**

- Mode: Aperture
- Display in Arcsec:
- Calibrate:
- Magnitude Calibration: Intensity 46870, Exposure 45, Magnitude 12
- Spatial Calibration: Pixel scale X 10.00, Y 10.00, FITS scale available, Diagonal from Start corner

czekamy aż program zakończy identyfikację gwiazdy na pozostałych zdjęciach

The screenshot displays the 'axim DL Pro 5 - Photometry' software interface. The main window shows a dark field of stars with a green circle highlighting a specific star. On the left, the 'Photometry' panel lists an 'Image list' with multiple entries of 'SS CYG-5003-R001' and a 'Tagged objects' list that is currently empty. Below the list, there are fields for 'Time-identification field' (set to 'Date/time from FIT'), 'Mouse click tags as:' (set to 'New Object'), and 'Ref Mag'. There are also checkboxes for 'Act on all images', 'Use star matching', and 'Snap to centroid'. The 'Time of image (Mid-exp.)' is shown as '2011-06-30 02:19:31.0 JD 2455742.596897'. On the right, the 'Screen Stretch' panel shows a histogram and 'Minimum' (190.64) and 'Maximum' (502.05) values. The 'Information' panel displays various parameters for the selected star, including 'Pixel Maximum', 'Minimum', 'Median', 'Average', 'Std Dev', 'Magnitude Intensity', 'SNR', 'Bgd Avg', 'Bgd Dev', 'Centroid', 'FWHM', and 'Flatness'. The 'Mode' is set to 'Aperture', and 'Display in Arcsec' is checked. The 'Magnitude Calibration' section shows 'Intensity' (46870), 'Exposure' (45), and 'Magnitude' (12). The 'Spatial Calibration' section shows 'Pixel scale X' (10.00) and 'Y' (10.00).



po zakończeniu identyfikacji pojawiają się zielone okręgi symbolizujące rozmiar pierścieni do mierzenia zliczeń

The screenshot displays the 'astm DL Pro 5 - Photometry' software interface. The main window shows a star field with two green circles around a star, labeled 'Obj1 (1516,1011)'. The interface includes several panels:

- Photometry Panel:** Contains an 'Image list' with multiple entries for 'SS CYG-5003-R001', a 'Tagged objects' list with 'Obj1 (1516,1011)', and a 'Time/identification field' with 'Date/time from FIT' and 'Time of image (Mid-exp.)' set to '2011-06-30 02:19:31.0 JD 2455742.596897'. It also has 'Exclude', 'Untag', and 'View Plot...' buttons.
- Screen Stretch Panel:** Shows a histogram and a 'Medium' stretch level. Minimum and maximum values are 190.64 and 502.05, respectively.
- Information Panel:** Displays cursor coordinates (X=1570, Y=1003) and a table of photometric data:

Pixel	209.139	Magnitude	
Maximum	247.717	Intensity	0.000
Minimum	177.818	SNR	0.000
Median	211.919		
Average	211.438	Bgd Avg	212.816
Std Dev	11.652	Bgd Dev	12.791

Below the table, it shows 'Centroid (X=1570.000, Y=1003.000)' and 'FWHM' and 'Flatness' values. The 'Mode' is set to 'Aperture' and 'Display in Arcsec' is checked. The 'Magnitude Calibration' section shows 'Intensity' (46870), 'Exposure' (45), and 'Magnitude' (12). The 'Spatial Calibration' section shows 'Pixel scale X' (10.00) and 'Y' (10.00).

## rozmiary pierścienia można zmieniać samodzielnie

The screenshot displays the Maxim DL Pro 5 software interface. The main window is titled "Photometry - SS CYG-5003-R001-C001-V.fits". The interface includes a menu bar, a toolbar, and a central image of a star field. A star is highlighted with a green circle, and a context menu is open over it. The context menu options are: Tag New Object, Tag New Moving Object, Tag New Reference Star, Tag New Check Star, Large Rings, Increase Aperture, Decrease Aperture, Set Aperture Radius, Increase Gap Width, Decrease Gap Width, Set Gap Width, Increase Annulus, Decrease Annulus, Set Annulus Thickness, Crosshairs, Screen Stretch, Zoom In, Zoom Out, Point Telescope Here, and Slow to PinPoint Center. A vertical toolbar next to the menu lists actions 1 through 12, with option 8 "Slow to PinPoint Center" selected.

**Photometry Panel (Left):**

- Image list:** Lists multiple image files (e.g., SS CYG-5003-R001-C001-V.fits).
- Tagged objects:** Shows "Obj1 (1516,1011)".
- Time/Identification field:** Includes "Date/time from FIT" and "Time of Image (Mid-exp.)" (2011-06-30 02:19:31.0 JD 2455742.596897).
- Mouse click tags as:** Set to "New Object".
- Ref Mag:** Input field.
- Buttons:** Exclude, Untag, View Plot..., Close.
- Checkboxes:** Act on all images, Use star matching, Snap to centroid.

**Screen Stretch Panel (Top Right):**

- Minimum:** 190.64
- Maximum:** 502.05
- Mode:** Medium
- Buttons:** Update

**Information Panel (Bottom Right):**

<b>Cursor</b>	
Pixel Maximum Intensity	Magnitude
Minimum Intensity	SNR
Average	Bgd Avg
Std Dev	Bgd Dev
Centroid	Flatness
FWHM	

Mode: Aperture | Display in Arcsec | Calibrate <<

**Magnitude Calibration**

Intensity: 45870 | Extract from image

Exposure: 45 | Set from FITS

Magnitude: 12 | Apply

**Spatial Calibration**

Pixel scale X: 10.00 | FITS scale available

Set... Y: 10.00 | Diagonal from: Start corner

## Photometry

Image list

- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001
- SS CYG-5003-R001

Tagged objects

- Obj1 (1523,1011)

Time/Identification field

Date/time from FIT

Exclude Unrag

Time of image (Mid-exp)

2011-06-30 02:19:31.0  
JD 2455742.596897

View Plot... Close

Mouse click tags as:

New Object

Ref Mag

Act on all images

Use star matching

Snap to centroid



## Screen Stretch

Minimum 190.64 Maximum 502.05

Medium

Update >>

## Information

Cursor (X= 1523, Y= 989), Rad= 13, Rad2= 24

Pixel	225.628	Magnitude	
Maximum	314.571	Intensity	0.000
Minimum	182.865	SNR	0.000
Median	221.921		
Average	224.353	Bgd Avg	1133.254
Std Dev	18.630	Bgd Dev	5691.594

Centroid (X= 1523.000, Y= 989.000)

FWHM Flatness

Mode Aperture  Display in Arcsec Calibrate <<

Magnitude Calibration

Intensity 46870 Extract from image

Exposure 45 Set from FITS

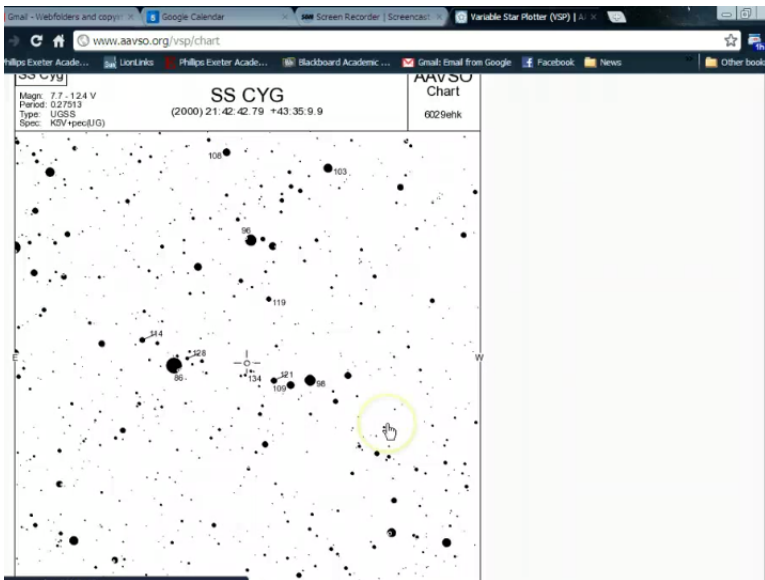
Magnitude 12 Apply

Spatial Calibration

Pixel scale X 10.00  FITS scale available

Set... Y 10.00 Diagonal from Start corner

sprawdzamy gwiazdę porównania odczytując jej jasność z mapki





## wyberamy New Reference Object z rozwijanej listy

The screenshot shows the 'Photometry' dialog box in the software. The 'Image list' contains several entries for 'SS CYG-5003-R001'. The 'Tagged objects' list shows 'Obj1 (1516,1011)'. In the 'Mouse click tags as:' section, the following options are listed: (none), New Object, New Moving Object, **New Reference Star** (highlighted with a yellow circle), and New Check Star. Below this list are checkboxes for 'Act on all images', 'Use star matching', and 'Snap to centroid'. The 'Time/identification field' shows 'Date/time from FIT' and 'Time of image (Mid-exp.)' as '2011-06-30 02:19:31.0 JD 2455742.596897'. The 'Screen Stretch' panel shows a histogram and 'Minimum' (190.64) and 'Maximum' (502.05) values. The 'Information' panel shows cursor statistics for 'Obj1', including Pixel, Magnitude, Intensity, SNR, Average, Bgd Avg, Bgd Dev, Centroid, and FWHM. The 'Magnitude Calibration' section shows 'Intensity' (46870), 'Exposure' (45), and 'Magnitude' (12). The 'Spatial Calibration' section shows 'Pixel scale X' (10.00) and 'Y' (10.00).

i klikamy na gwiazdę porównania, uzupełniając wartość jej jasności

The screenshot displays the PixInsight software interface with the Photometry tool active. The main window shows a star field with two stars highlighted: 'Obj1' (green circle) and 'Ref1' (red circle). The 'Photometry' panel on the left lists the image list and tagged objects. The 'Information' panel on the right shows the properties of the selected star, including its magnitude (12.00).

**Photometry Panel:**

- Image list: SS CYG-5003-R001, SS CYG-5003-R002, SS CYG-5003-R003, SS CYG-5003-R004, SS CYG-5003-R005, SS CYG-5003-R006, SS CYG-5003-R007, SS CYG-5003-R010, SS CYG-5003-R011, SS CYG-5003-R012
- Tagged objects: Obj1 (1516, 1011), Ref1 (1773, 1087)
- Time/Identification field: Date/time from FIT
- Mouse click tags as: New Reference Star
- Ref Mag: 9.8
- Buttons: Exclude, Untag, View Plot..., Close
- Time of image (Mid-exp): 2011-06-30 02:19:31.0 JD 2455742.596897
- Options: Act on all images, Use star matching, Snap to centroid

**Screen Stretch Panel:**

- Minimum: 190.64
- Maximum: 502.05
- Update button

**Information Panel:**

- Cursor: Pixel, Magnitude, Intensity, SNR, Average, Bgd Avg, Std Dev, Bgd Dev, Centroid, Flatness, FWHM
- Mode: Aperture, Display in Arcsec, Calibrate <<
- Magnitude Calibration: Intensity (46870), Exposure (45), Magnitude (12), Extract from image, Set from FITS, Apply
- Spatial Calibration: Pixel scale X (10.00), Y (10.00), FITS scale (available), Diagonal from (Start corner)

wyberamy New Check Star i wyszukujemy gwiazdy kontrolnej

The screenshot displays the MaxDL Pro 5 Photometry software interface. The main window shows a star field with two stars identified: 'Obj1' (1516, 1011) and 'Ref1' (1773, 1087). The 'Photometry' panel on the left lists the image and tagged objects. The 'Information' panel on the right provides detailed data for the selected star.

**Photometry Panel:**

- Image list: SS CYG-5003-R001, SS CYG-5003-R002, SS CYG-5003-R003, SS CYG-5003-R004, SS CYG-5003-R005, SS CYG-5003-R006, SS CYG-5003-R007, SS CYG-5003-R008, SS CYG-5003-R009, SS CYG-5003-R010, SS CYG-5003-R011, SS CYG-5003-R012
- Tagged objects: Obj1 (1516, 1011), Ref1 (1773, 1087)
- Time/identification field: Date/time from FIT, Exclude, Untag
- Time of image (Mid-exp): 2011-06-30 02:19:31.0, JD 2455742.596897
- Act on all images, Use star matching, Snag to centroid

**Information Panel:**

Cursor (X= 1694, Y= 1101), Rad= 13, Rad2= 24

Pixel	7772.587	Magnitude	11.298
Maximum	7772.587	Intensity	119317.008
Minimum	177.811	SNR	410.288
Median	231.909		
Average	437.951	Bgd Avg	212.439
Std Dev	815.079	Bgd Dev	12.644

Centroid (X= 1693.739, Y= 1100.909)  
FWHM 30.239" Flatness 0.128

Mode Aperture  Display in Arcsec Calibrate <<

Magnitude Calibration

Intensity	46870	Extract from image
Exposure	45	Set from FITS
Magnitude	12	Apply

Spatial Calibration

Pixel scale X	10.00	FITS scale available
Set... Y	10.00	Diagonal from Star corner

**Photometry**

**Image list**

- SS CYG-5003-R001
- SS CYG-5003-R002
- SS CYG-5003-R003
- SS CYG-5003-R004
- SS CYG-5003-R005
- SS CYG-5003-R006
- SS CYG-5003-R007
- SS CYG-5003-R008
- SS CYG-5003-R009
- SS CYG-5003-R010
- SS CYG-5003-R011
- SS CYG-5003-R012

**Tagged objects**

- Chk1 (1694, 1101)
- Obj1 (1516, 1011)
- Ref1 (1773, 1082)

Time-identification field  
Date/Time from FIT

Mouse click tags as:  
New Check Star

Ref Mag

Exclude Unring

Time of image (Mid-exp.)  
2011-06-30 02:19:31.0  
JD 2455742.596887

Act on all images  
Use star matching  
Snap to centroid

View Plot... Close

**Screen Stretch**

Minimum: 190.64  
Maximum: 502.05  
Medium

Update

**Information**

**Cursor**

Pixel	Magnitude
Maximum	Intensity
Minimum	SNR
Median	
Average	Bgd Avg
Std Dev	Bgd Dev
Centroid	
FWHM	Flatness

Mode: Aperture  Display in Arcsec Calibrate <<

**Magnitude Calibration**

Intensity: 46870 Extract from image  
Exposure: 45 Set from FITS  
Magnitude: 12 Apply

**Spatial Calibration**

Pixel scale X: 10.00 FITS scale  available  
Set... Y: 10.00 Diagonal from Star corner

wszystkie gwiazdy powinny mieć podobną jasność

The screenshot displays the astrometry.net software interface. The main window shows a star field with three stars highlighted in green circles and labeled: Obj1 (1661, 1111), Chk1 (1483, 1021), and Ref1 (1740, 1092). The interface is divided into several panels:

- Photometry:** Contains an image list, tagged objects, and options for time identification and mouse click tags.
- Screen Stretch:** Shows a histogram and allows for adjusting the minimum and maximum intensity values (174.42 and 475.97).
- Information:** Provides detailed data for the selected star, including pixel intensity, magnitude, centroid, and FWHM.

**Photometry Panel:**

- Image list: SS CYG-5003-R001, SS CYG-5003-R011, SS CYG-5003-R011, SS CYG-5003-R011, SS CYG-5003-R011, SS CYG-5003-R011, SS CYG-5003-R011, SS CYG-5003-R011, SS CYG-5003-R011, SS CYG-5003-R011, SS CYG-5003-R021.
- Tagged objects: Obj1 (1661, 1111), Obj1 (1483, 1021), Ref1 (1740, 1092).
- Time identification field: Date/time from FIT.
- Mouse click tags as: (none).
- Ref Mag: [input field]
- Buttons: Exclude, Unlink, View Plot..., Close.
- Time of image (Mid-exp): 2011-06-30 02:47:59.0, JD 2455742.616655.
- Options:  Act on all images,  Use star matching,  Snap to centroid.

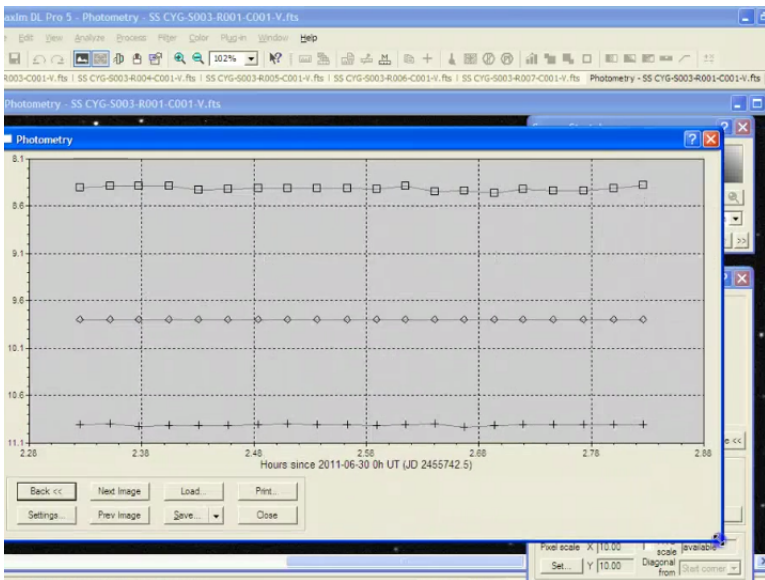
**Screen Stretch Panel:**

- Minimum: 174.42
- Maximum: 475.97
- Medium: [dropdown menu]
- Buttons: Update, [right arrow]

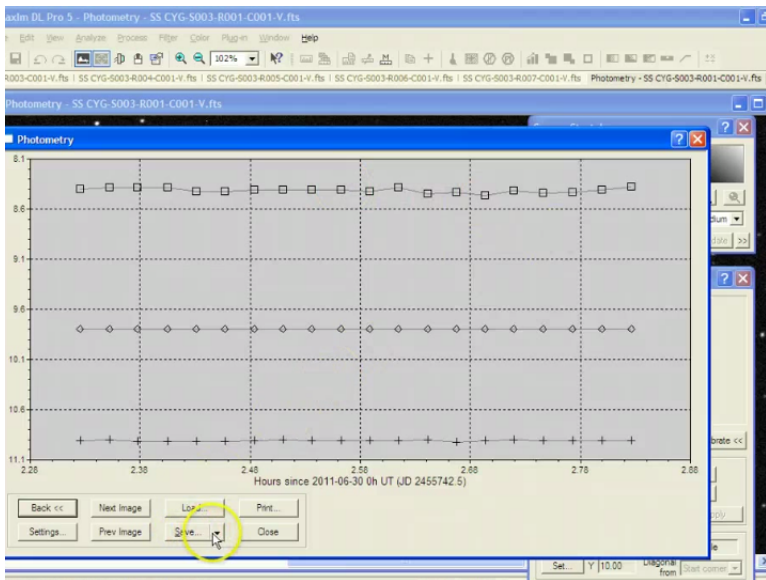
**Information Panel:**

- Cursor: Pixel, Magnitude, Intensity, SNR, Minimum, Average, Std Dev, Bgd Avg, Bgd Dev, Centroid, Flatness, FWHM.
- Mode: Aperture, Display in Arcsec, Calibrate <<
- Magnitude Calibration: Intensity (46870), Exposure (45), Magnitude (12), Extract from image, Set from FITS, Apply.
- Spatial Calibration: Pixel scale X (10.00), Y (10.00), FITS scale available, Diagonal from, Start corner.

klikamy na View Plot aby obejrzeć krzywą blasku



wyniki pomiaru jasności można zapisać do pliku tekstowego



SS CYG TEST.csv - Microsoft Excel

Home Insert Page Layout Formulas Data Review View Developer

Calibri 11 A A

Font Alignment Number

General

Conditional Formatting Format as Table Cell Styles

Insert Delete Format

Sort & Filter Find & Select Editing

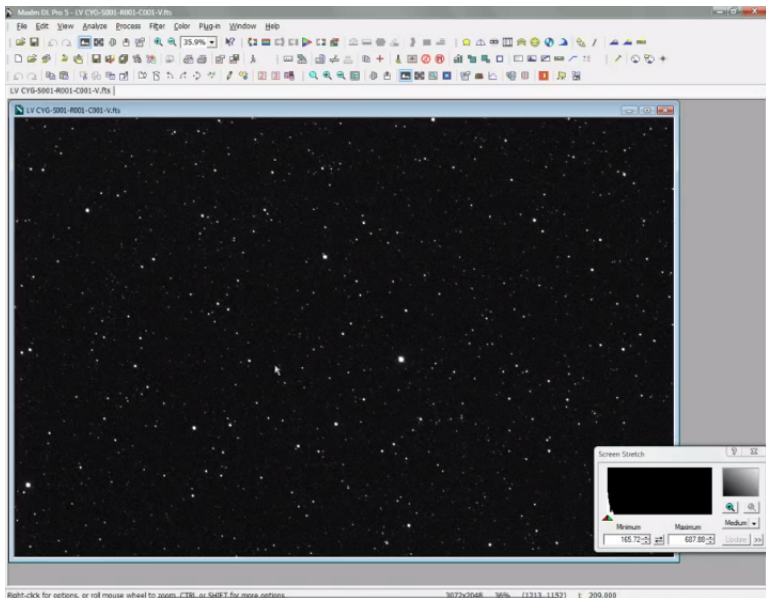
10R x 1C 8.4

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
(JD)		Obj1	Ref1	Chk1										
	2455742.597	8.4	9.8	10.908										
	2455742.598	8.384	9.8	10.9										
	2455742.599	8.386	9.8	10.92										
	2455742.6	8.386	9.8	10.914										
	2455742.601	8.428	9.8	10.918										
	2455742.602	8.422	9.8	10.916										
	2455742.603	8.412	9.8	10.906										
	2455742.605	8.411	9.8	10.901										
	2455742.606	8.408	9.8	10.906										
	2455742.607	8.413	9.8	10.907										
	2455742.608	8.422	9.8	10.913										
	2455742.609	8.389	9.8	10.907										
	2455742.61	8.448	9.8	10.902										
	2455742.611	8.437	9.8	10.929										
	2455742.612	8.465	9.8	10.913										
	2455742.613	8.42	9.8	10.903										
	2455742.614	8.44	9.8	10.907										
	2455742.616	8.435	9.8	10.907										
	2455742.617	8.41	9.8	10.911										
	2455742.618	8.38	9.8	10.908										

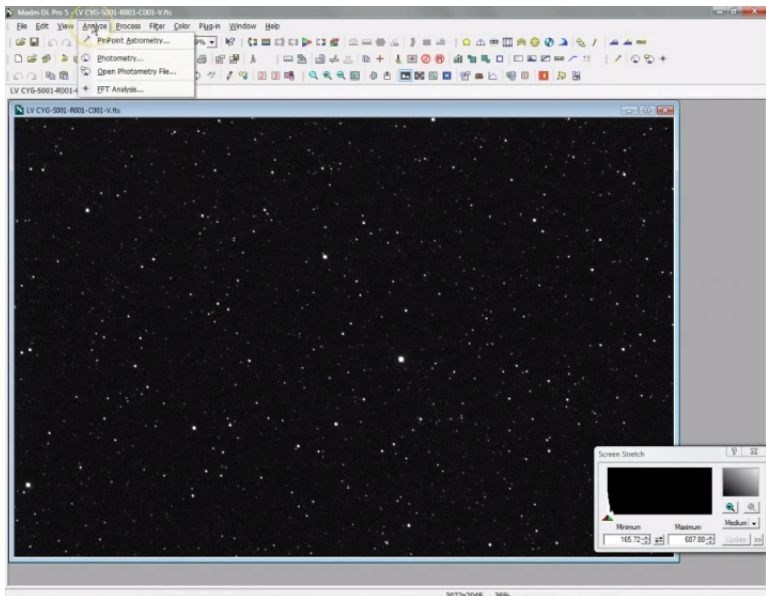


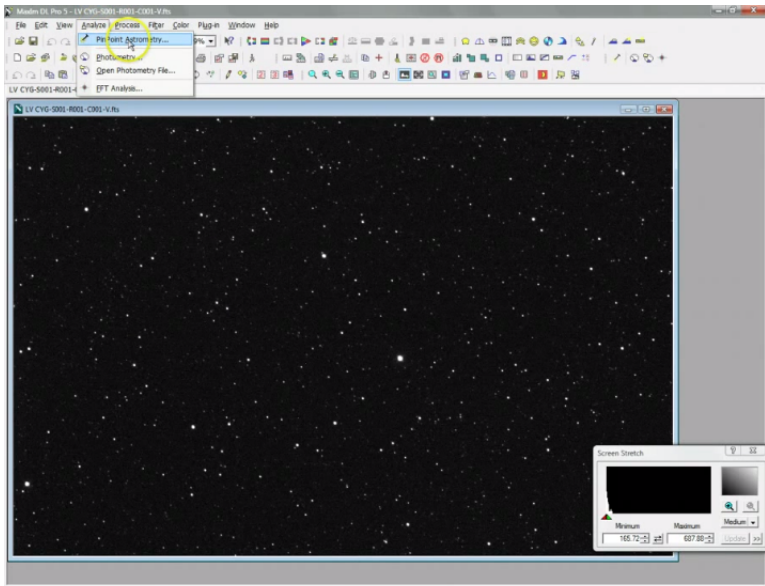
# Astrometria

identyfikacja gwiazd w polu może przebiegać w oparciu o ich współrzędne niebieskie - rektascencje i deklinacje



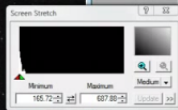
## wybieramy menu Analize i PinPoint Astrometry



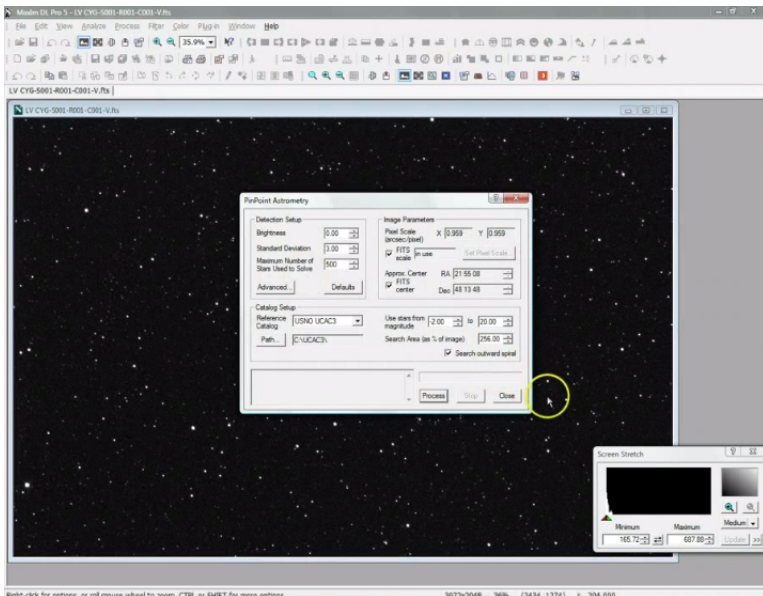


Deterrere astronomic plate constants

3072x2048 36%



pojawi się okno z podstawowymi parametrami do prawidłowego przekształcenia współrzędnych każdego piksela w współrzędne niebieskie



Right-click for options, or roll mouse wheel to zoom. CTRL or Shift for more options.

3672x2048 36% (2434, 1274) © 204,880

wyberamy katalog obiektów odpowiedni dla naszego pola

The screenshot shows the MaxDL Pro 5 interface with the PerPoint Astronomy dialog box open. The dialog is divided into several sections:

- Detection Setup:** Brightness (0.00), Standard Deviation (1.00), Maximum Number of Stars Used to Solve (500).
- Image Parameters:** Pixel Scale (X: 0.369, Y: 0.369 arcsec/pixel), FITS scale (checked), Approx. Center (RA: 21 55 03, Dec: 48 13 48), FITS center (checked).
- Catalog Setup:** Reference Catalog (USNO LAC3), Catalog (GSC-1.1), Path (connected). A yellow circle highlights the Reference Catalog dropdown menu, which is open to show a list of catalogs: USNO LAC3, GSC-1.1, Tycho 2, USNO-A2.0, USNO-SAZ.0, USNO-ICT, USNO LAC2, GSC-1.1 (small), USNO B1.0 (net), USNO B1.0 (all), and NORMAD (net).
- Other Settings:** Use stars from magnitude (2:00 to 20:00), Search Area (254.00%), Search outward spiral (checked).

Buttons for Process, Stop, and Close are visible at the bottom of the dialog.

For Help, press F1

3072x2048 36%

The Screen Stretch dialog box is shown in the bottom right corner. It includes a preview window, a color calibration bar, and input fields for Minimum (145.72) and Maximum (607.80) values. The color bar is currently set to Medium.

klikamy Process, aby powiązać ze sobą gwiazdy z katalogu i naszego zdjęcia

The screenshot shows the MaxDL Pro 5 software interface. The main window displays a star field image. A dialog box titled "PerPoint Astrometry" is open, allowing for astrometric calibration. The dialog is divided into several sections:

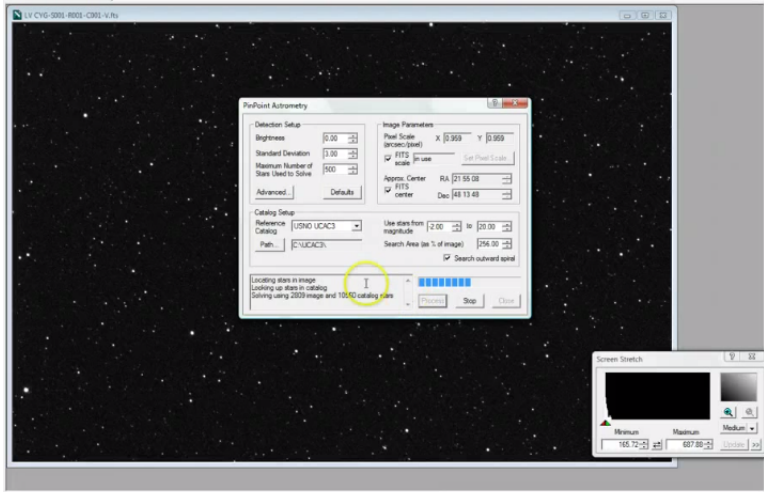
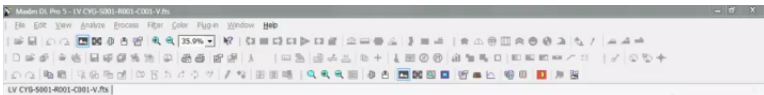
- Detection Setup:** Brightness (0.00), Standard Deviation (1.00), Maximum Number of Stars Used to Solve (500).
- Image Parameters:** Pixel Scale (X: 0.369, Y: 0.369 arcsec/pixel), FITS in use (checked), Approx. Center RA (21 55 03), FITS center Dec (48 13 48).
- Catalog Setup:** Reference Catalog (USNO U1AC2), Path (C:\USNO\...), Use stars from magnitude (-2.00 to 20.00), Search Area (254.00 %), Search outward spiral (checked).

At the bottom of the dialog, there are three buttons: "Process" (highlighted with a yellow circle), "Stop", and "Close".

In the bottom right corner, a "Screen Stretch" dialog is also visible, showing a grayscale calibration bar with "Minimum" (145.72) and "Maximum" (607.80) values, and a "Medium" dropdown menu.

For Help, press F1

3072x2048 36%





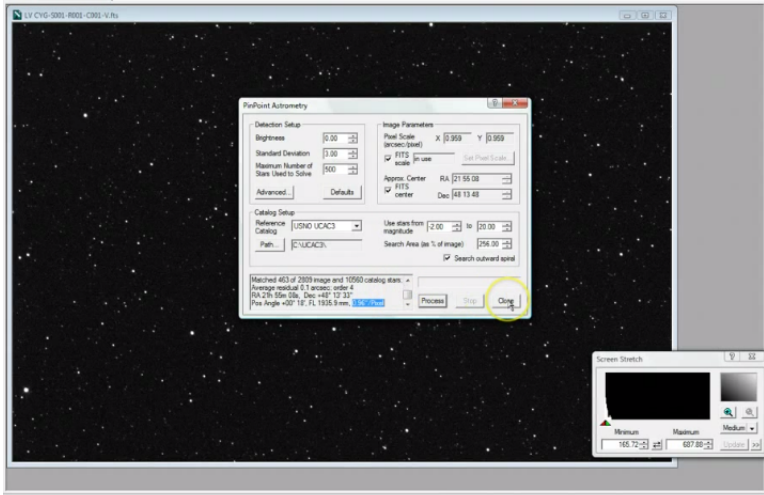
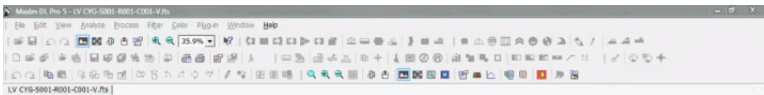
## pojawia się informacja o dopasowaniu obrazów i gwiazd

The screenshot displays the MaxDL Pro 5 interface with a star field image. A 'PerPoint Astrometry' dialog box is open, showing the following settings and results:

- Detection Setup:**
  - Brightness: 0.00
  - Standard Deviation: 1.00
  - Maximum Number of Stars Used to Solve: 500
- Image Parameters:**
  - Pixel Scale (arcsec/pixel): X 0.959 Y 0.959
  - FITS in use
  - Approx. Center RA: 21 55 03
  - FITS center Dec: 48 13 48
- Catalog Setup:**
  - Reference Catalog: USNO UCAC3
  - Path: C:\UCAC3
  - Use stars from magnitude: -2.00 to 20.00
  - Search Area (as % of image): 254.00
  - Search outward spiral
- Matched 463 of 2809 image and 15560 catalog stars.**
  - Average residual 0.7 arcsec/pixel
  - RA 21h 55m 03s, Dec +48° 13' 37"
  - Pos. Angle +00° 18', Fl. 1935.9 mm, 0.90"/pixel

Buttons: Process, Stop, Close

At the bottom right, a 'Screen Stretch' dialog box is visible, showing a grayscale calibration bar with 'Minimum' (145.72) and 'Maximum' (607.80) values, and a 'Medium' dropdown menu.



**PerPoint Astrometry**

**Detection Setup**

Brightness: 0.00  
Standard Deviation: 1.00  
Maximum Number of Stars Used to Solve: 500

**Image Parameters**

Pixel Scale X: 0.369 Y: 0.369 (arcsec/pixel)  
 FITS in use  
Approx. Center RA: 21 55 03  
 FITS center Dec: 48 13 48

**Catalog Setup**

Reference Catalog: USNO UCAC3  
Path: C:\UCAC3  
Use stars from magnitude: -2.00 to 20.00  
Search Area (as % of image): 254.00  
 Search outward spiral

Matched 463 of 2809 image and 10560 catalog stars.  
Average residual 0.7 arcsec, order 4  
RA 21h 55m 03s, Dec +48° 13' 33"  
Pos Angle +00° 18', Fl 1935.9 mm.

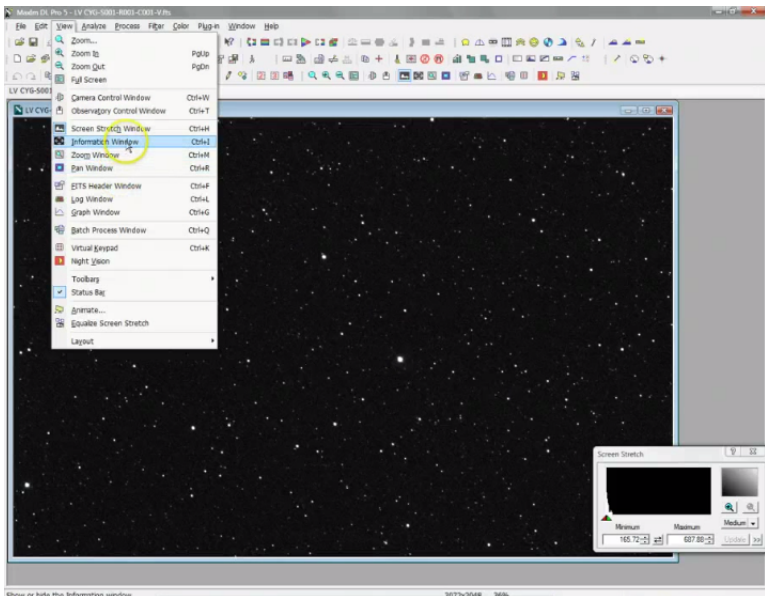
Process Stop **Close**

**Screen Stretch**

Minimum Maximum Medium

145.72 607.80 Update

otwieramy okno Information Window



Mainly DL Pro 5 - LV CY6-5001-8001-C001-V.Rts

File Edit View Analyze Process Filter Color Plug-in Window Help

35.9%

LV CY6-5001-8001-C001-V.Rts

Information

Center (X= 759.000, Y= 244.000, Rad= 8, Rad2= 15)

Pixel	186.000	Magnitude	
Maximum	230.000	Intensity	0.000
Minimum	170.000	Shift	0.000
Median	203.000		
Average	202.250	Bgd Avg	202.326
Std Dev	12.694	Bgd Dev	12.131

Centered (X= 759.000, Y= 244.000)  
Radius

Mode Aperture  Display in Arcsec Calibrate >>

Screen Stretch

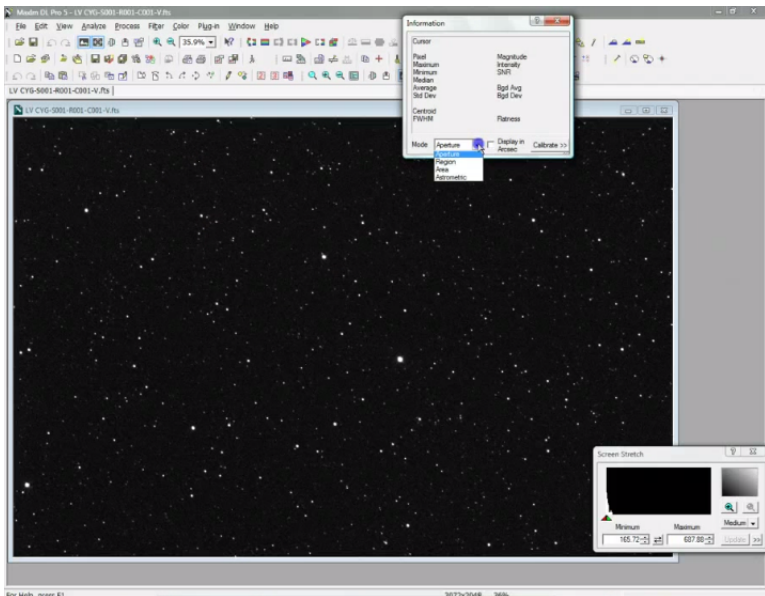
Minimum Maximum Medium

145.72 607.80 Update

Right-click for options, or rol mouse wheel to zoom. CTRL or SHIFT for zoom actions.

3072x2048 36% (750, 344) x 196.000

z rozwijanej listy wybieramy opcję Astrometric



For Help, press F1

3072x2048 36%

każda gwiazda ma ustalone współrzędne niebieskie

The screenshot displays the MaxIm DL software interface. The main window shows a star field image. An "Information" dialog box is open, displaying the following data for a selected star:

Parameter	Value
Cursor	
Pixel	
Maximum	Magnitude
Minimum	Intensity
Median	SNR
Average	Bgrd Avg
Std Dev	Bgrd Dev
Centroid	
FWHM	Flatness

The "Mode" dropdown menu is open, showing options: Aperture, Region, and Area. The "Screen Stretch" dialog box is also open, showing a histogram and the following values:

Minimum	Maximum
145.72	607.80

The status bar at the bottom indicates "3072x2048 36%".

Main Window: LV CYG-5001-8001-C001-V.Rts

Information Dialog:

Cursor	(X= 1802, Y= 479)	Rad= 8, Rad2= 15
	21 55 01.48	48 22 16.2
Centroid	(1536.265, 433.140)	
	21 55 01.95	48 22 14.1
Image Star	N/A with PixPure LE	
Catalog Star	N/A with PixPure LE	

Mode:  Calibrate >>

Screen Stretch Dialog:

Minimum	Maximum	Medium
145.72	607.80	Unlocks >>

Bottom Status Bar: 3072x2048 36% (1802, 479) x: 211.800

Main6 DL Pro 5 - LV CYG-5001-8001-C001-V.Rs

File Edit View Analyze Process Filter Color Plug-in Window Help

LV CYG-5001-8001-C001-V.Rs

Information

Cursor: (X= 1246, Y= 704, Rad= 8, Rad2= 15  
21 55 35.51 48 19 37.5

Centroid: (1246.000, 704.000)  
21 55 35.51 48 19 37.5

Image Star: N/A with PinPoint LE

Catalog Star: N/A with PinPoint LE

Mode:  Calibrate >>

Screen Stretch

Minimum Maximum Medium

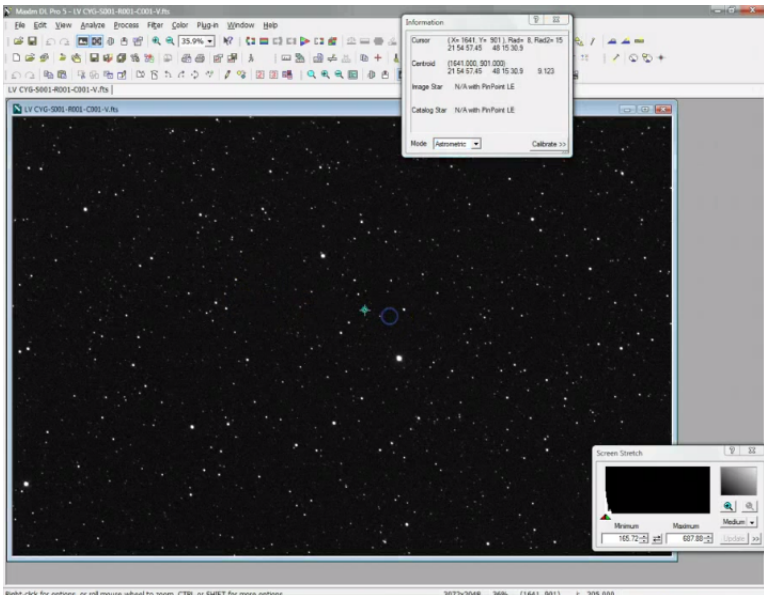
145.72 607.80 Update >>

Right-click for options, or roll mouse wheel to zoom. CTRL or SHIFT for zoom notches.

3072x2048 36% (1246, 704) t: 216.000

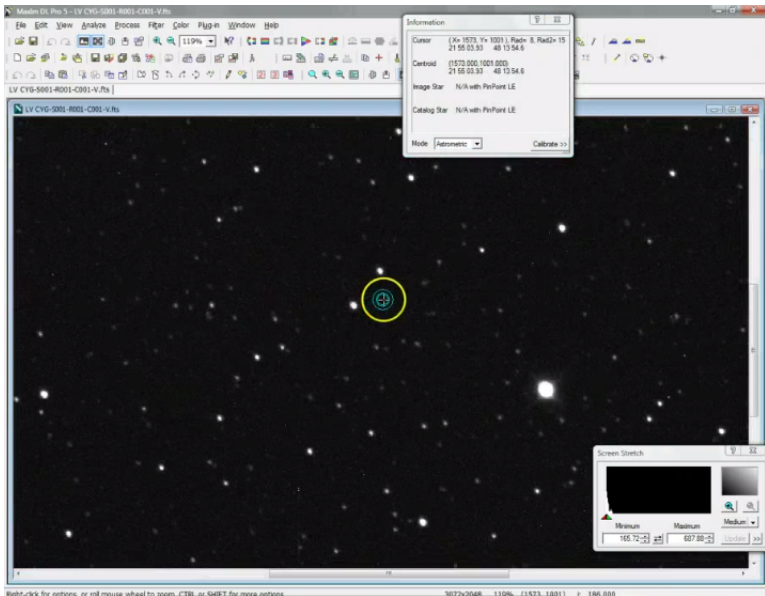
The screenshot shows the Main6 DL Pro 5 software interface. The main window displays a star field with a yellow circle around a star. An information window is open, showing cursor coordinates (X= 1246, Y= 704, Rad= 8, Rad2= 15) and centroid coordinates (1246.000, 704.000). The information window also shows that the image star and catalog star are N/A with PinPoint LE. The software has a menu bar (File, Edit, View, Analyze, Process, Filter, Color, Plug-in, Window, Help) and a toolbar. The status bar at the bottom shows the image size (3072x2048), zoom level (36%), cursor coordinates (1246, 704), and time (t: 216.000). A Screen Stretch dialog box is also visible in the bottom right corner, showing a histogram and a slider for adjusting the image contrast.

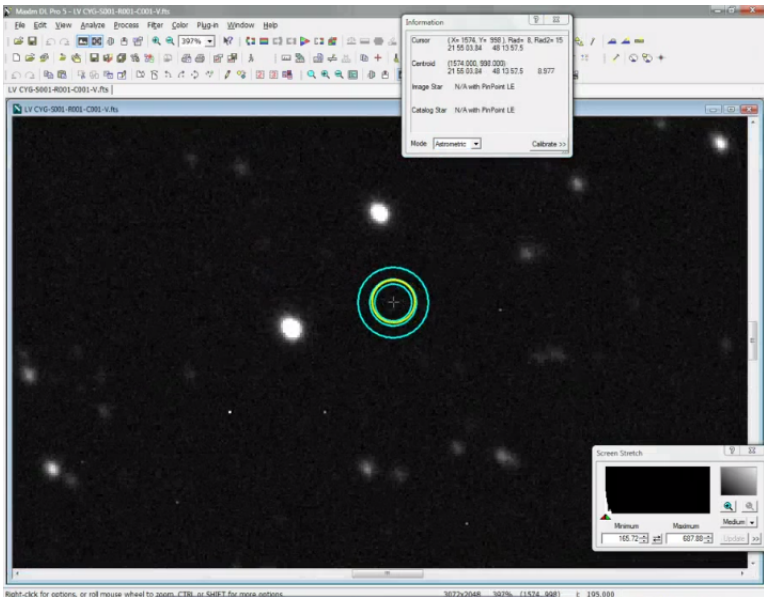


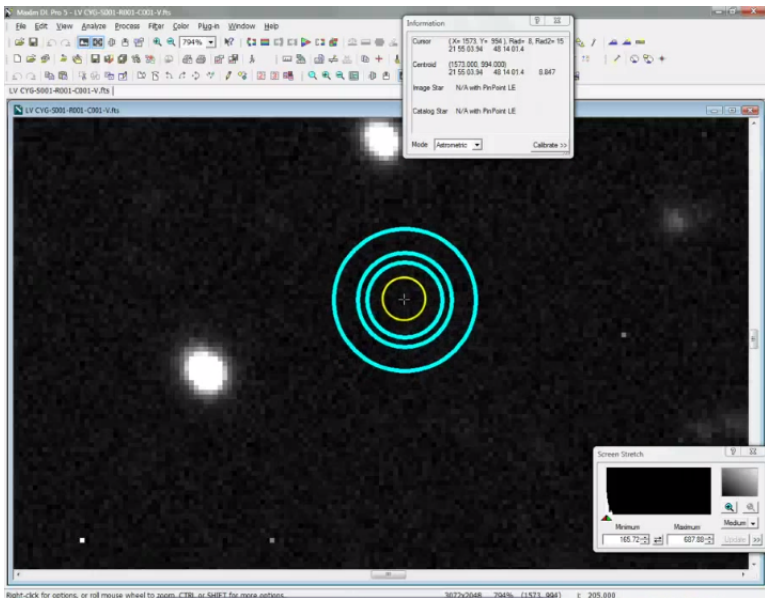


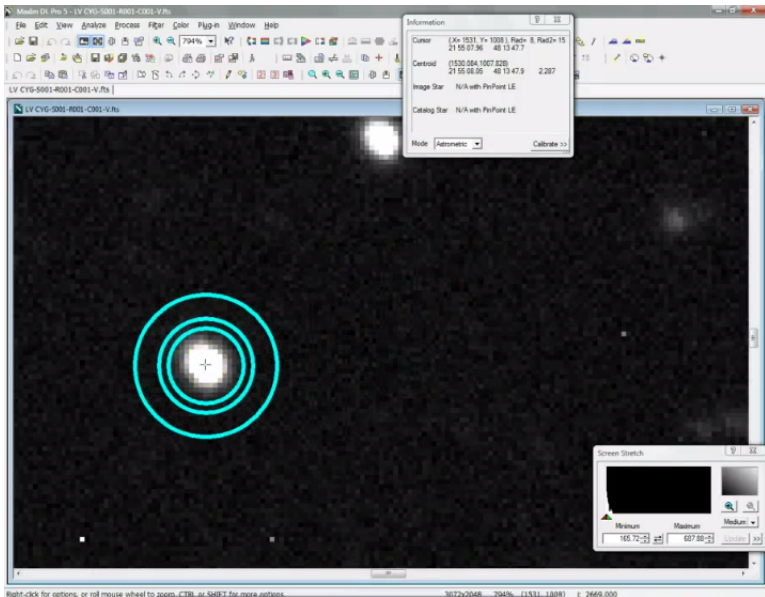
Right-click for options, or rol mouse wheel to zoom. CTRL or SHIFT for zoom options.

3072x2048 36% (1641, 901) t: 205.800





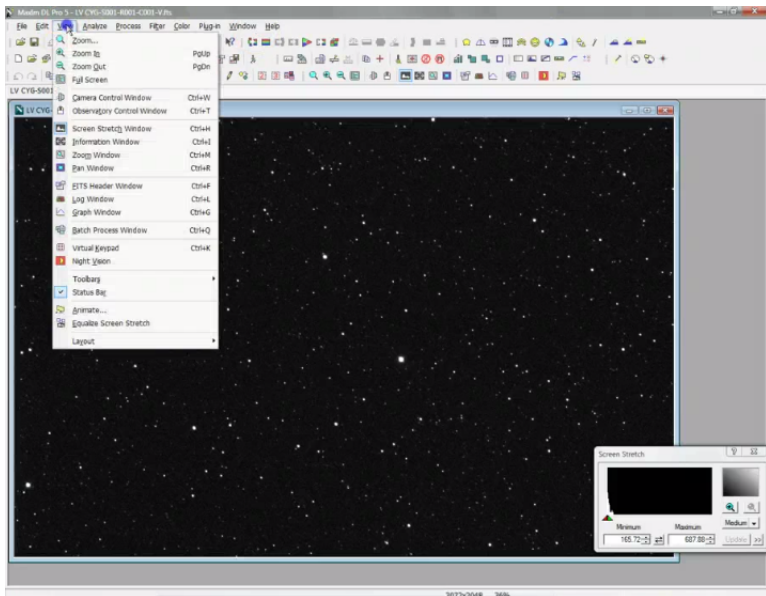




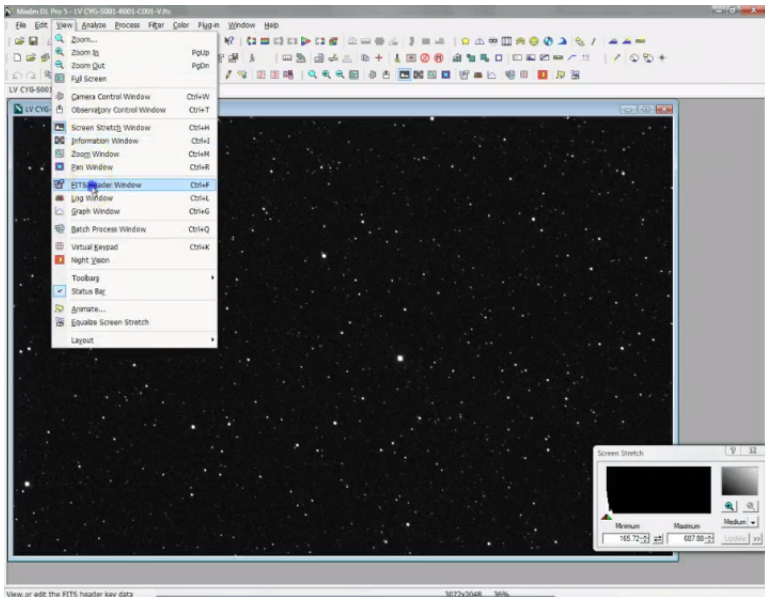
Right-click for options, or roll mouse wheel to zoom. CTRL+click for more options.

3672x2048 704% (1531, 1038) t: 2669.000

wybieramy podgląd nagłówka obrazu



## FITS Header Window



na samym końcu listy słów kluczowych i ich wartości są podane wzory transformacyjne dla naszego zdjęcia w standardzie WCS

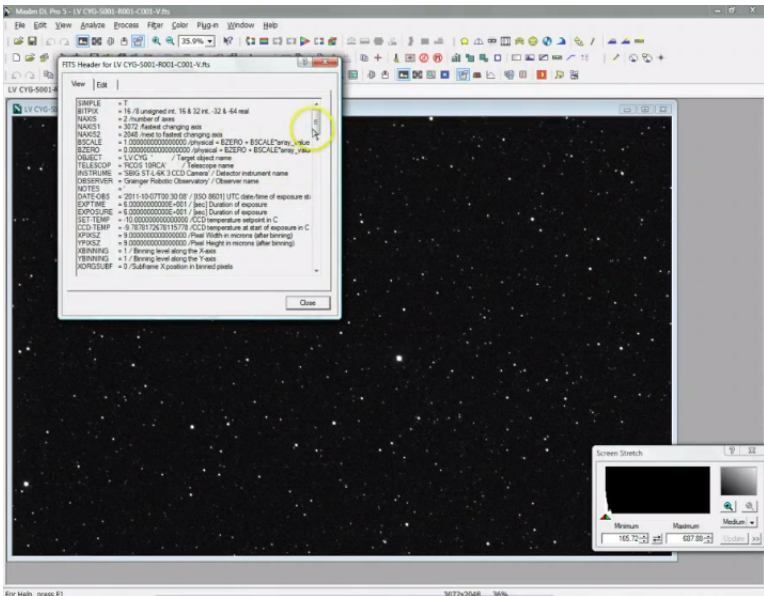
The screenshot displays the Maxima DL software interface. The main window shows a star field image. A window titled "FITS Header for LV CYG-5001-4001-C001-V1 fits" is open, displaying the following header information:

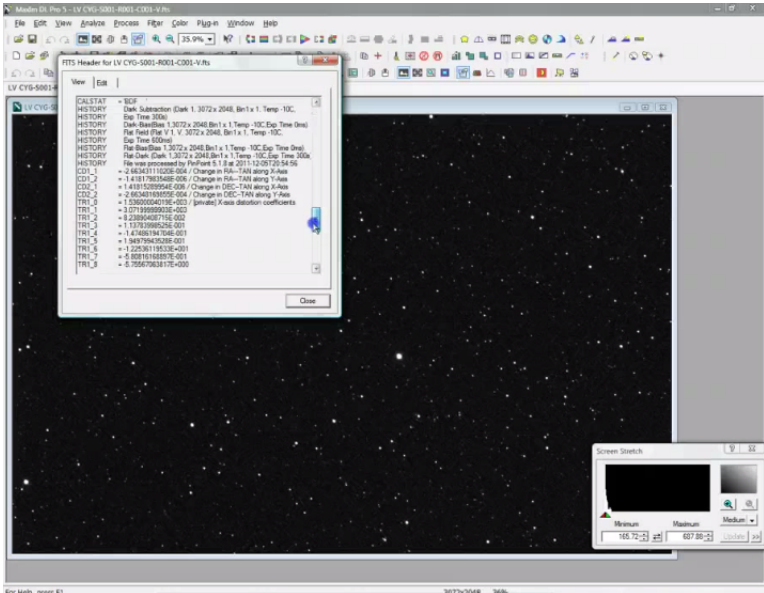
```
View Edit |
SIMPLE = T
BITPIX = 16 /B unsigned int. 16 & 32 int. -32 & -64 real
NAXIS1 = 2 /Number of axes
NAXIS2 = 2072 /Axial channel count
NAXIS3 = 2048 /Axial to face-at-charging axis
BSCALE = 1.000000000000000000 /physical B ZERO = BSCALE*array_value
BZERO = 0.000000000000000000 /physical B ZERO + BSCALE*array_value
OBJECT = LV CYG /Target object name
TELESCOP = RCOS 10PC / Telescope name
INSTRUME = 7865 STL-6K 3 CCD Camera / Detector instrument name
OBSERVER = Ungerer Roberto Observatory / Observer name
NOTES =
DATE-OBS = 2011-10-07T00:30:00 / ISO 8601 UTC date-time of exposure in
EXPTIME = 6.0000000000E+001 / (sec) Duration of exposure
EXPOSURE = 6.0000000000E+001 / (sec) Duration of exposure
SET_TEMP = -10.3000000000000000 / CCD temperature setpoint in C
CCD-TEMP = -9.787172678115776 / CCD temperature at start of exposure in C
XPPIXZ = 8.0000000000000000 / Pixel Width in microns (after binning)
YPPIXZ = 8.0000000000000000 / Pixel Height in microns (after binning)
XBINNING = 1 / Binning level along the X-axis
YBINNING = 1 / Binning level along the Y-axis
XCORGSUBP = 0 / Subframe X position in binned pixels
```

A "Screen Stretch" window is also visible, showing a zoomed-in view of the star field with a "Medium" stretch level selected. The zoomed-in view shows a star with a yellow circle around it. The zoomed-in view shows a star with a yellow circle around it. The zoomed-in view shows a star with a yellow circle around it.

At the bottom of the Maxima DL window, the status bar displays: "3072x2048 36% (1883, 362) © 193.000".







For Help, press F1

3072x2048 36%

Mainly DL Pro 5 - LV CYG-5001-R001-C001-V.Rts

File Edit View Analyze Process Filter Color Plug-in Window Help

LV CYG-5001-R001-C001-V.Rts

LV CYG-5001-R001-C001-V.Rts

View | Edit |

```
TR1_13 = -7.185462997556E-001
TR1_14 = -4.159896285002E-001
TR2_5 = 1.023959991175E-003 / (private) Y-axis distortion coefficients
TR2_1 = -2.552420931546E-003
TR2_2 = 2.047939999795E-003
TR2_3 = -3.9405795003E-002
TR2_4 = 3.07805757591E-001
TR2_5 = -2.64300525699E-001
TR2_6 = 1.579252786020E-001
TR2_7 = -8.95491279756E+000
TR2_8 = 1.81025181879E-001
TR2_9 = -4.2201678179E-000
TR2_10 = 1.37020306053E-001
TR2_11 = 7.43612013047E-002
TR2_12 = -6.52261102342E-001
TR2_13 = 5.69625210682E-001
TR2_14 = -6.89055152334E-001
HISTORY WCS updated by PerPort 5.1.8 at 2011-12-08T20:54:56
HISTORY Matched 463 stars from the USNO UCAC3 Catalog
HISTORY Average residual was 0.11 arc-seconds
PLTSOLVD = T / Plate has been solved by PerPort
```

Close

Screen Stretch

Minimum Maximum Medium

145.72 607.80 Update

For Help, press F1

3072x2048 36%