

# Αστροφωτογραφία & Επεξεργασία με CCD

Εξοπλισμός & Τεχνική



**WO ZS80FD**  
**VIXEN A80SS**  
**ATIK 16HR**  
**ATIK MFW**  
**LXD55**  
**LPI**





*Atik 16HR*

*Atik Manual Filter Wheel*



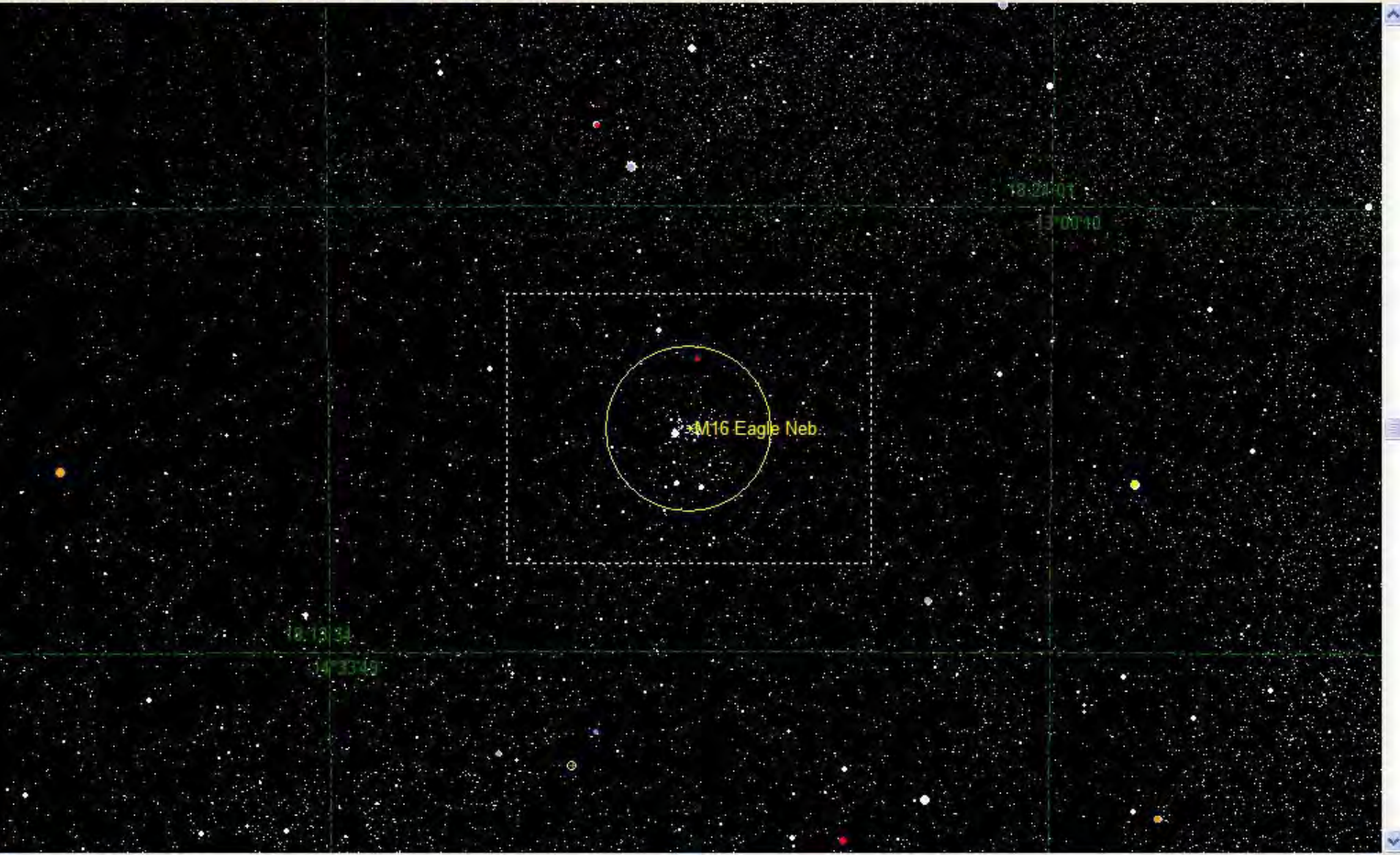
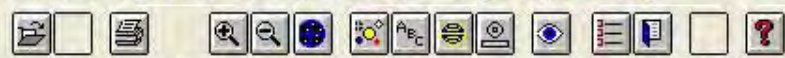
*Atik 16HR*

*Atik MFW*

*Vixen Flip Mirror*

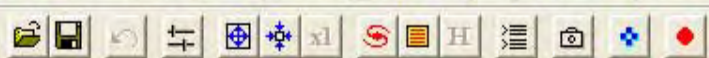
*WO 1:10 Focuser*





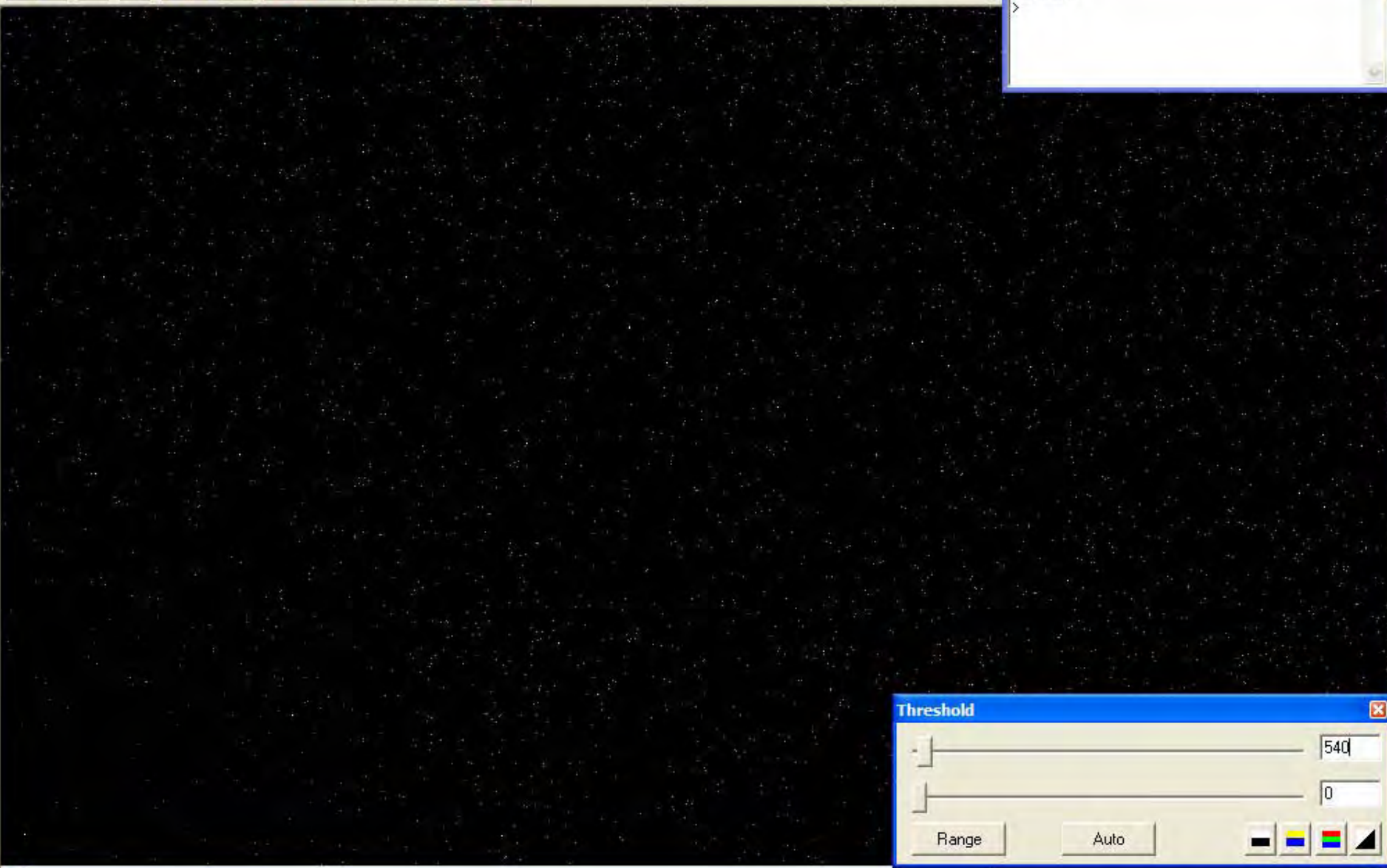
# *Επεξεργασία (Callibration – Post processing)*





```
Command  
>load h1
```





**Command**

```
>load d1  
>mult 300  
>
```

**Threshold**

540

0

Range Auto

A set of color selection icons including black, yellow, red, green, blue, and white.



*>smedian2 f 50*

*>div fm 3000*







Gaussian filter...

Selective gaussian filter...

Adaptative filter...

Unsharp masking...

Unsharp masking of a sequence...

Wavelets...

Grsp filter...

Blur filter...

Add...

Subtract...

Multiply...

Divide...

Clip max...

Clip min...

Add a sequence...

Subtract to a sequence...

Divide a sequence...

Add a constant to a sequence...

Multiply a sequence by a constant...

Drizzle...

Offset normalization of a sequence...

Gain normalization of a sequence...

**Stellar registration...**

Planetary registration (1) ...

Planetary registration (2) ...

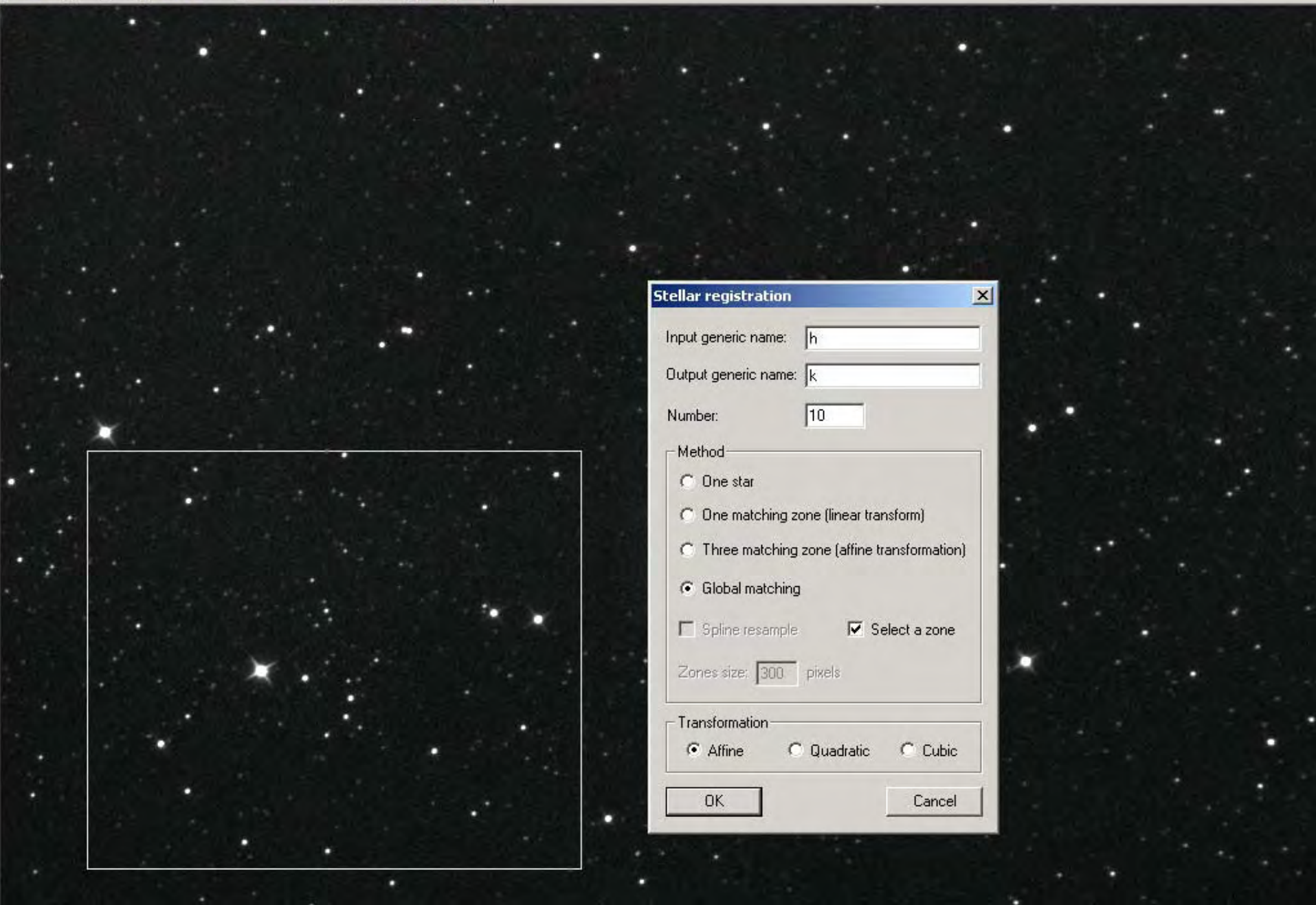
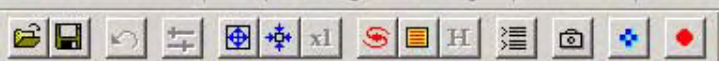
Align & stack (1)...

Align & stack (2)...

Remove gradient...

Ellipses fit...

Rotational gradient...



**Stellar registration** [X]

Input generic name:

Output generic name:

Number:

Method

- One star
- One matching zone (linear transform)
- Three matching zone (affine transformation)
- Global matching

Spline resample       Select a zone

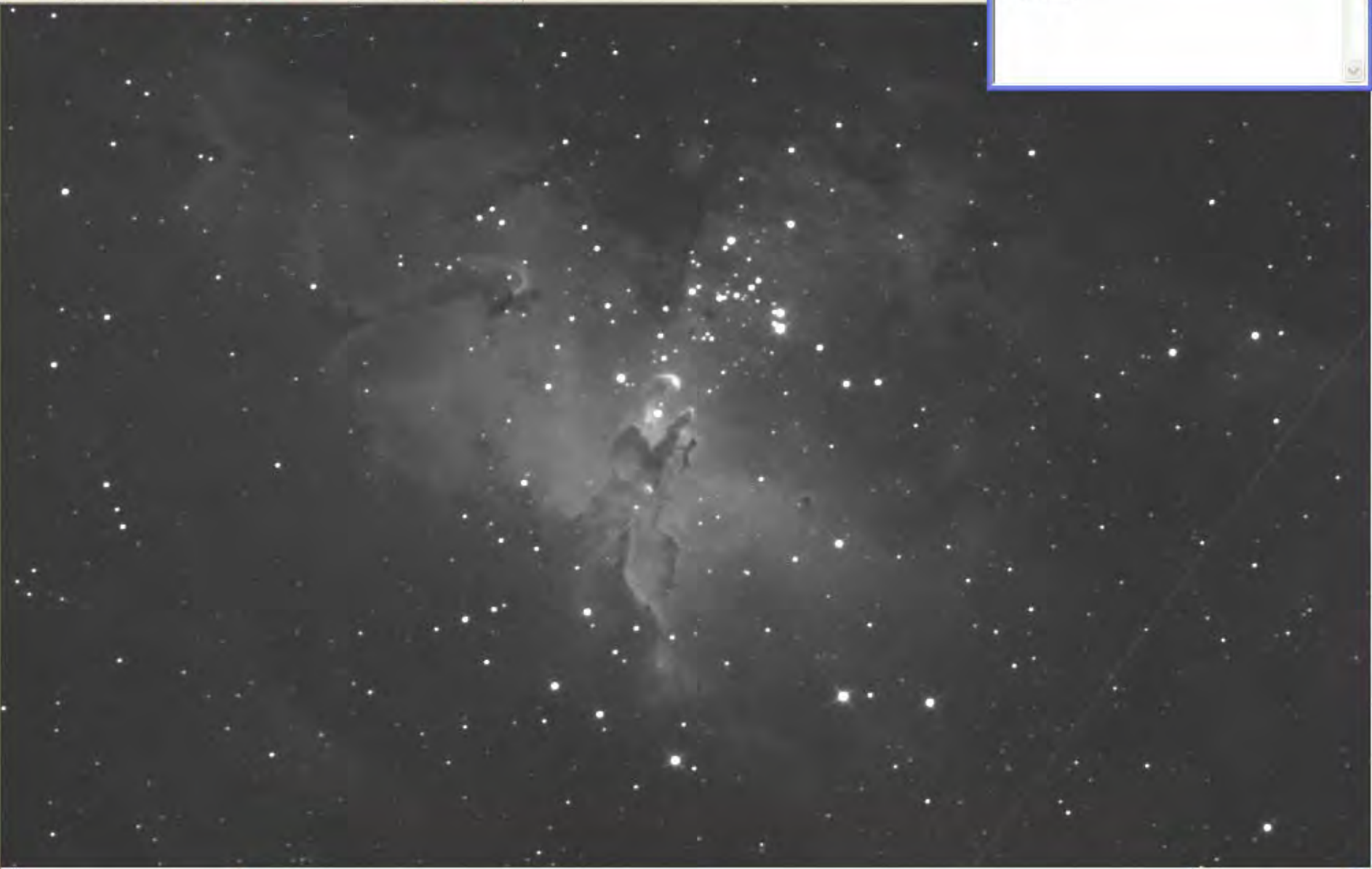
Zones size:  pixels

Transformation

- Affine
- Quadratic
- Cubic



```
Command  
>load hh72  
>add2 hh 72
```



# *Post processing*



- Logarithm
- Equalization
- Modified Equalization
- Dynamic stretching...
- Color stretching...
- Opacity masking...
- Ramp...

- Isophotes...
- 3D...
- Frame...

- Slice
- Plot
- Histogram

- Threshold of a sequence...
- Select images...
- Animate...

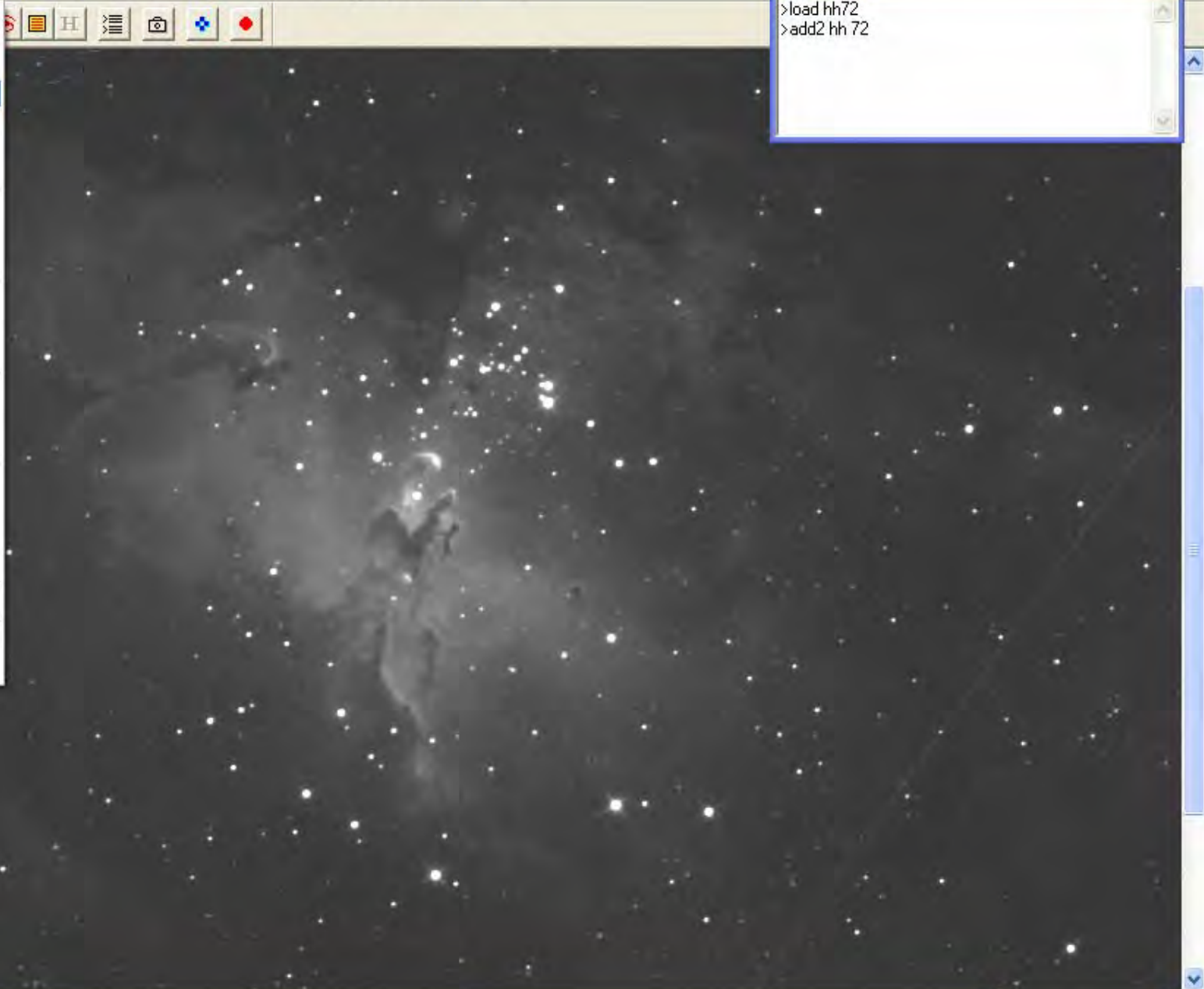
- (L)RGB...
- White balance...
- Gamma adjustment...
- Saturation adjustment...

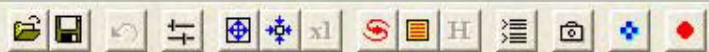
- Threshold...

- Toolbar
- Status bar

Command

```
>load hh72  
>add2 hh 72
```





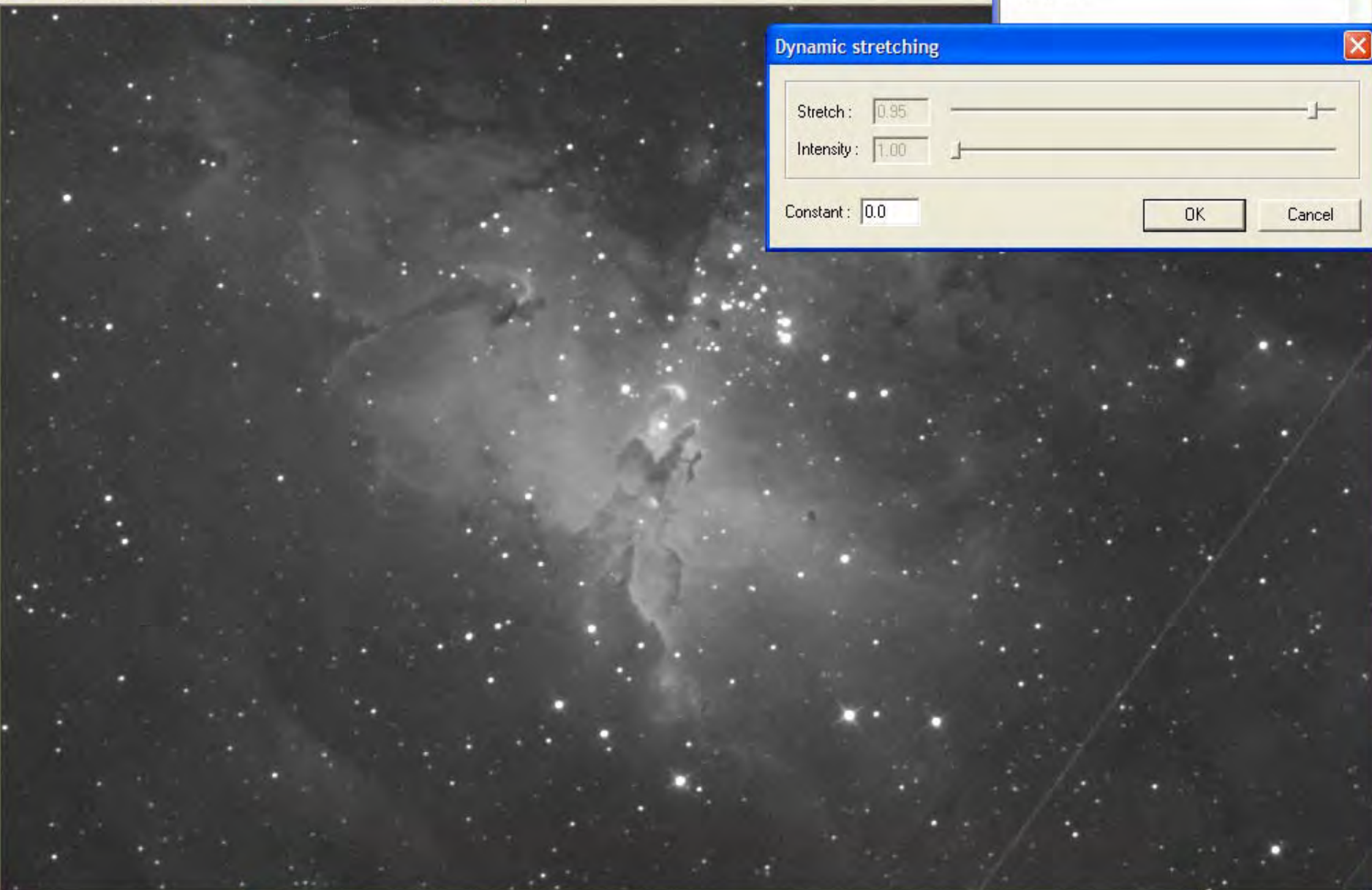
```
Command
>load hh72
>add2 hh 72
```

### Dynamic stretching

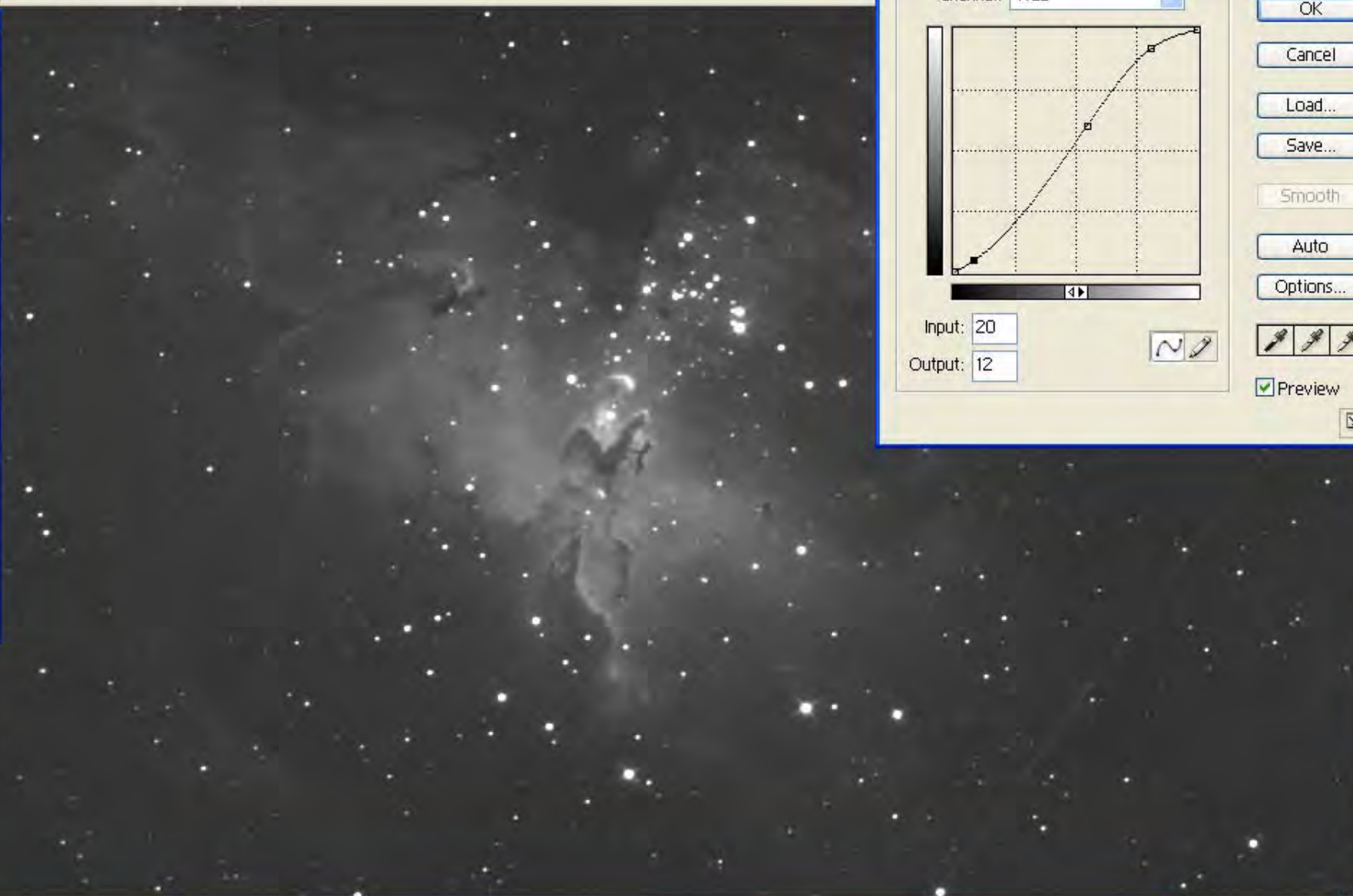
Stretch :

Intensity :

Constant :



Sample Size: Point Sample



### Curves

Channel: RGB

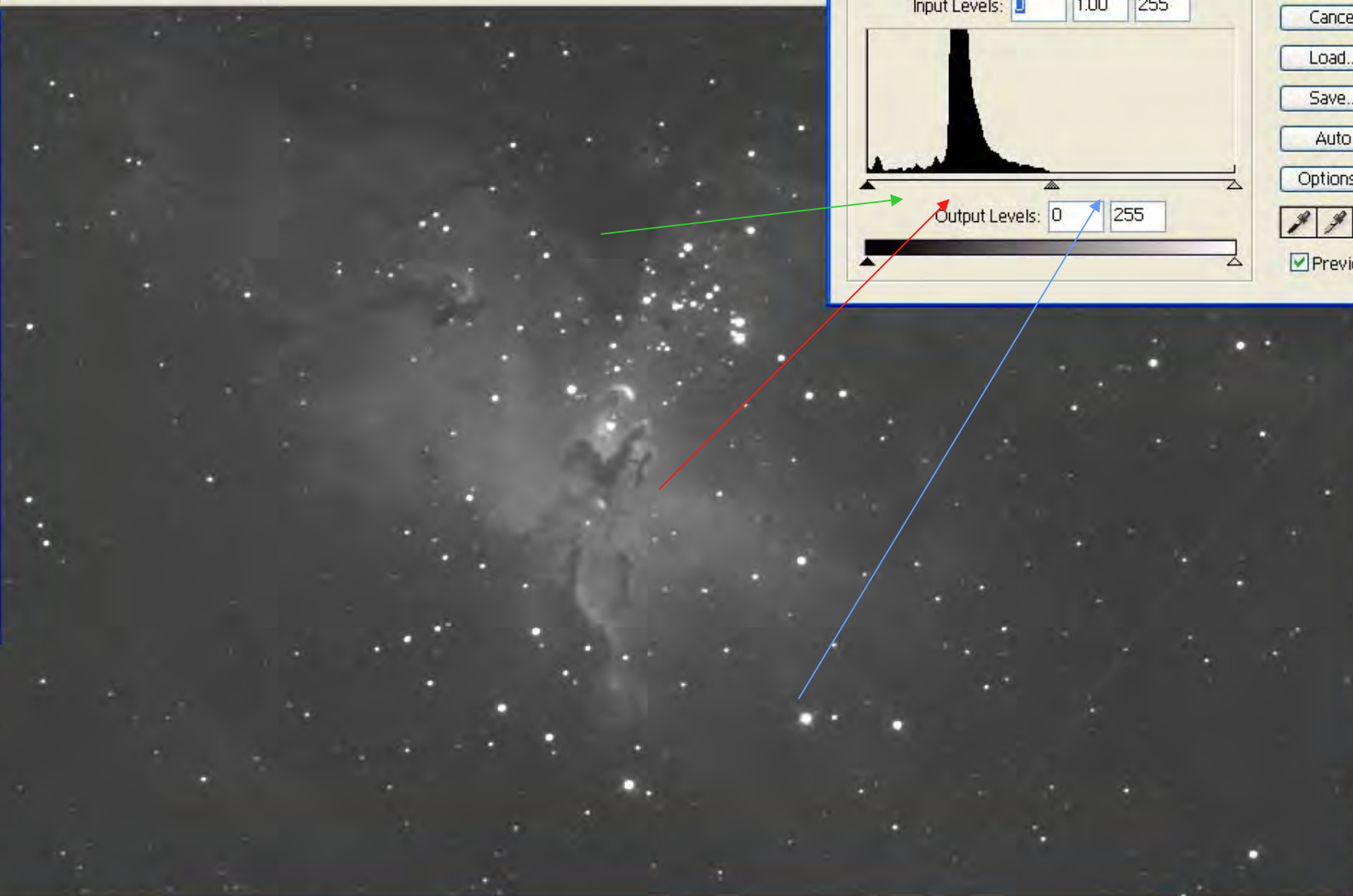
Input: 20  
Output: 12

Buttons: OK, Cancel, Load..., Save..., Smooth, Auto, Options...

Preview



Sample Size: Point Sample



### Levels

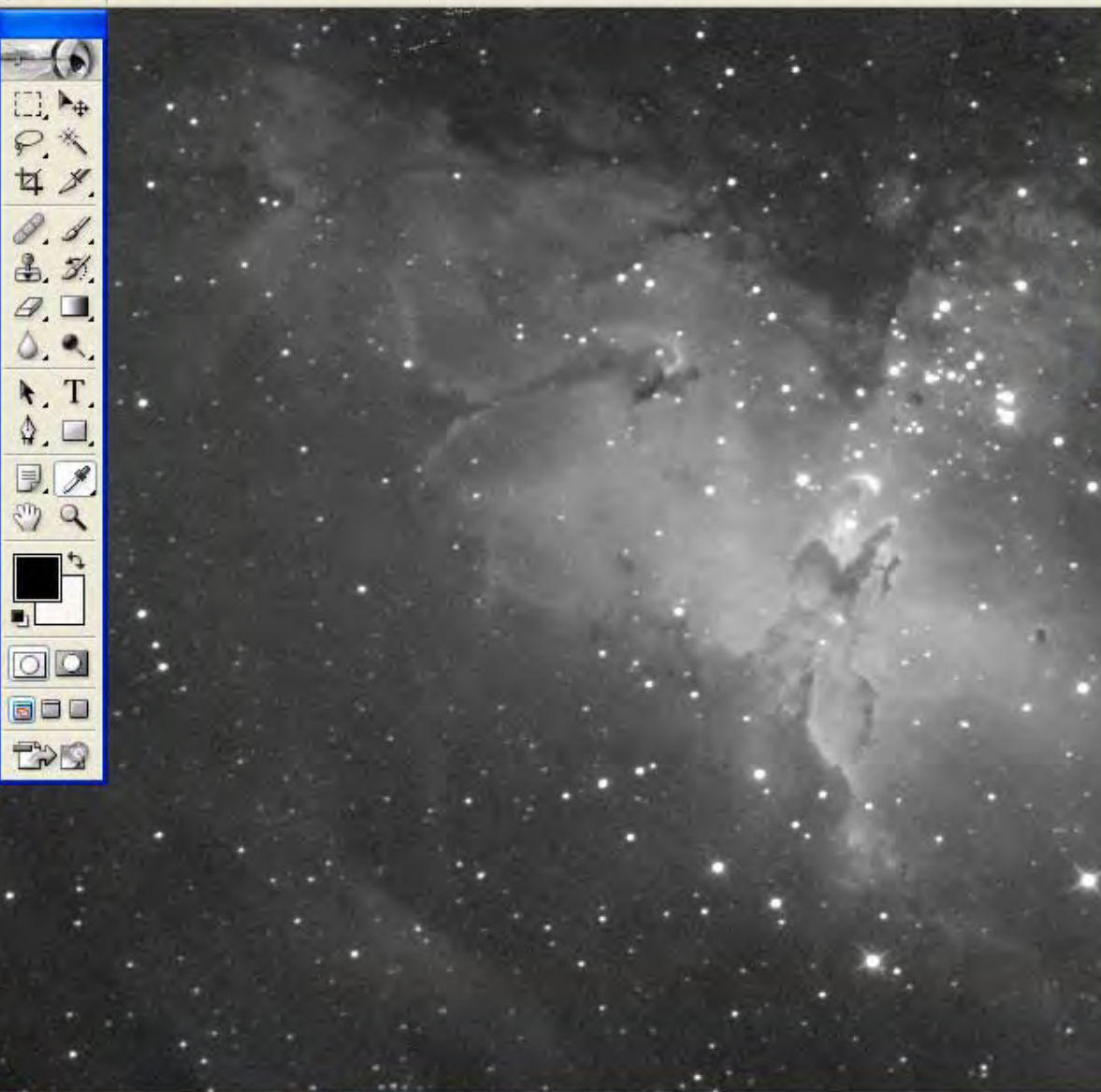
Channel: RGB

Input Levels: 0 1.00 255

Output Levels: 0 255

OK  
Cancel  
Load...  
Save...  
Auto  
Options...  
 Preview


Sample Size: Point Sample



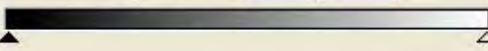
### Levels

Channel: RGB

Input Levels:

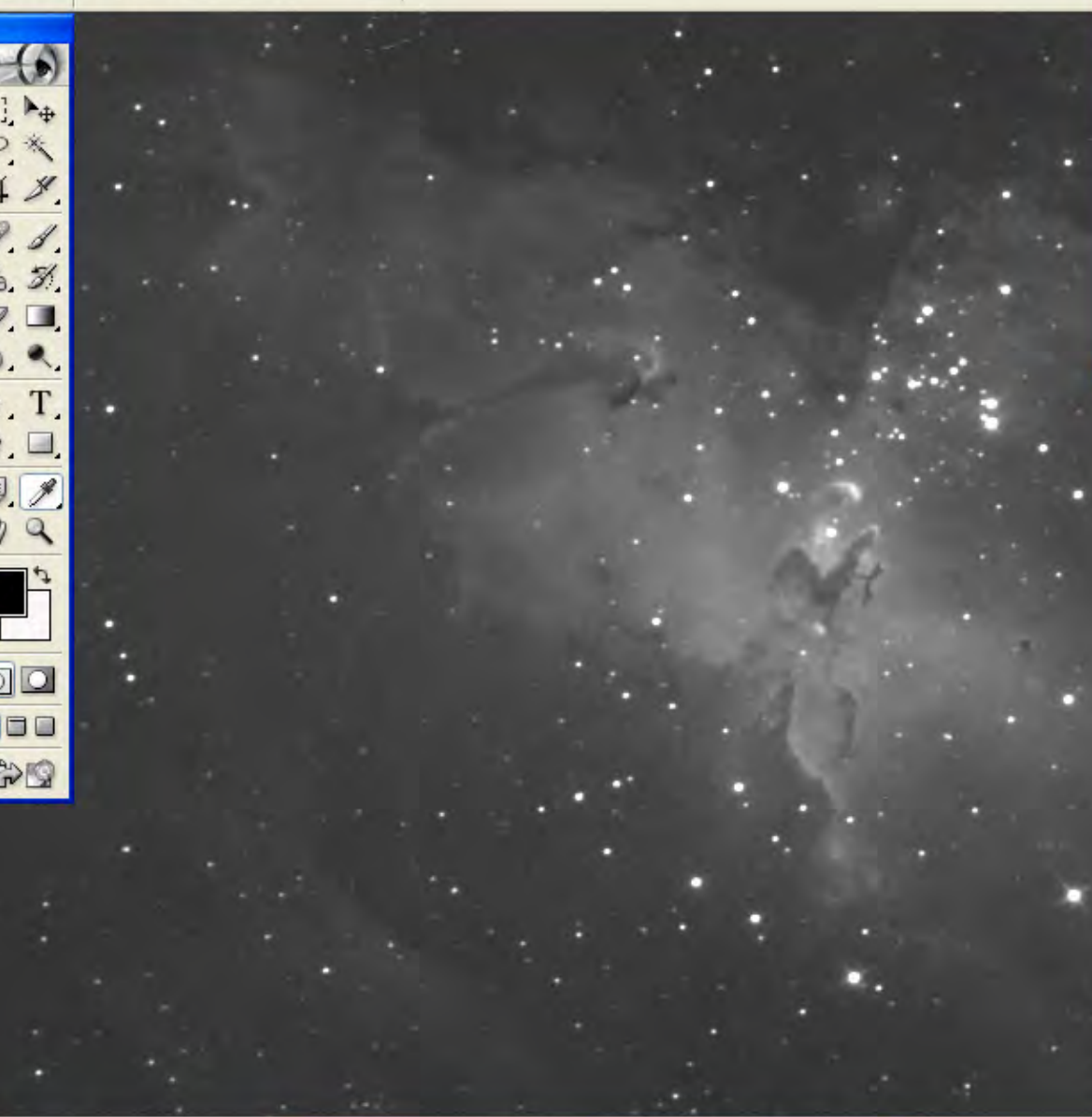


Output Levels:



- OK
- Cancel
- Load...
- Save...
- Auto
- Options...
- 
- Preview


Sample Size: Point Sample



### Levels

Channel: RGB

Input Levels: 41 1.50 255



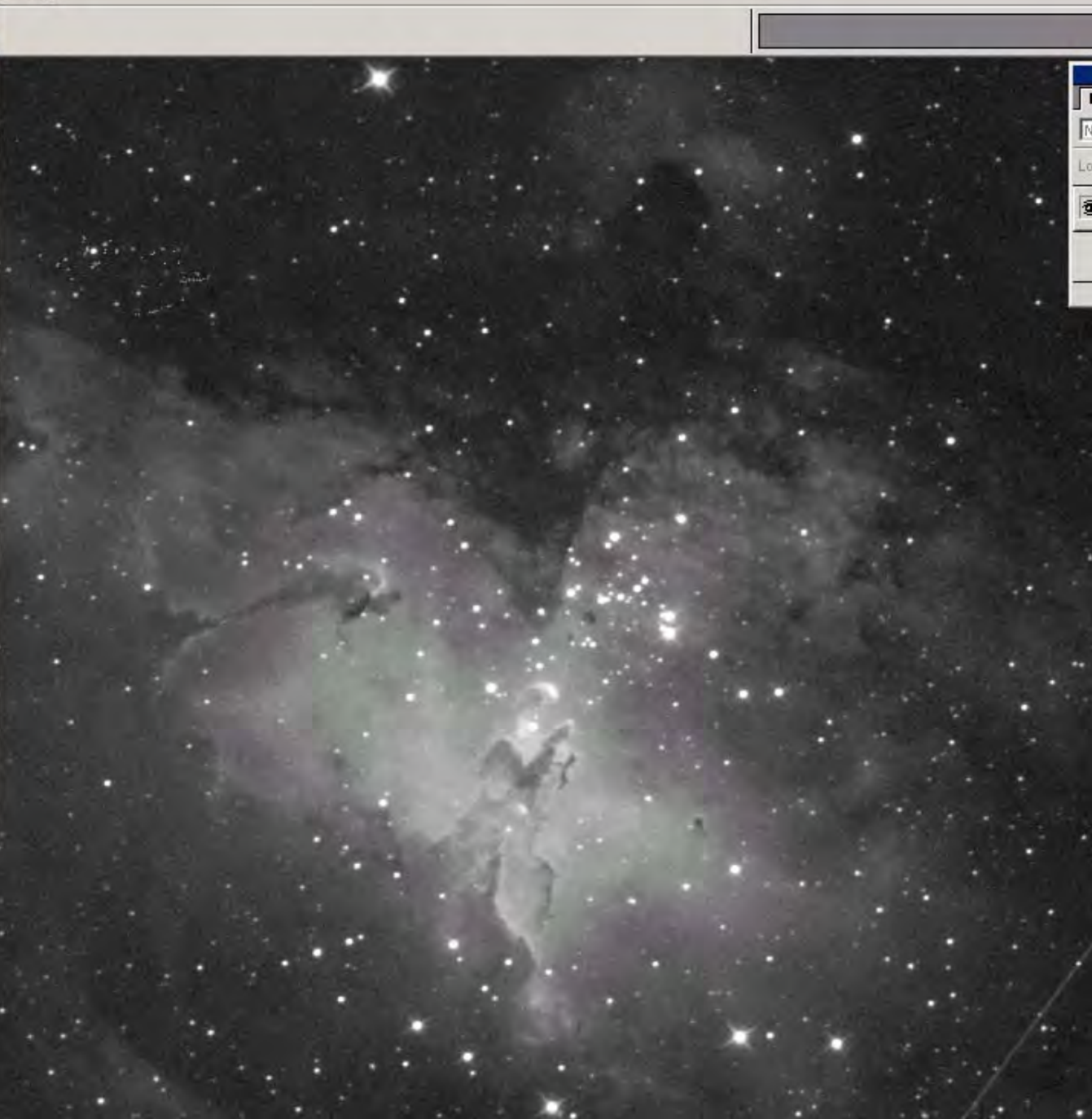
Output Levels: 0 255

Preview

OK  
Cancel  
Load...  
Save...  
Auto  
Options...



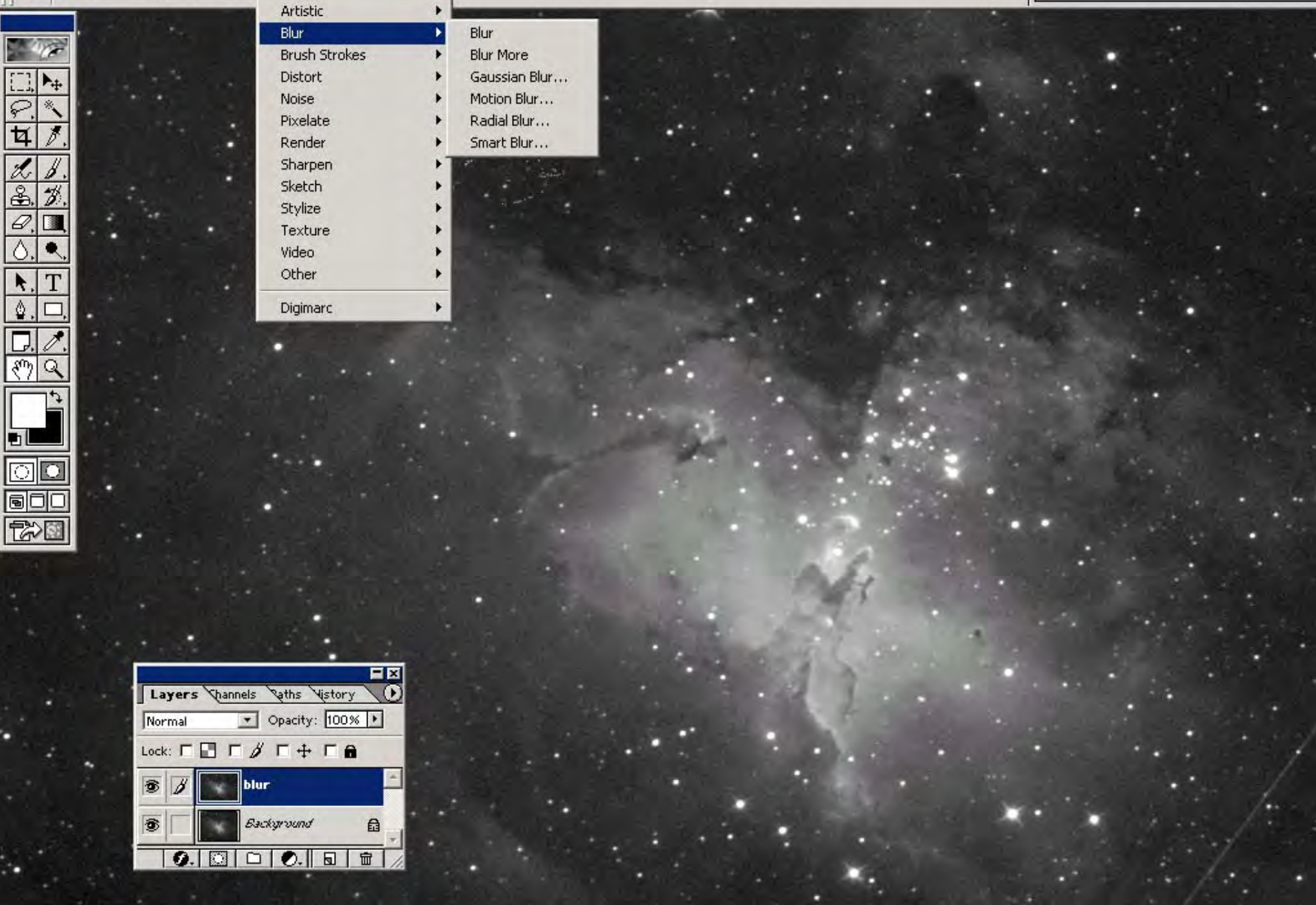
- New
- Duplicate Layer...
- Delete Layer
- Layer Properties...
- Layer Style
- New Fill Layer
- New Adjustment Layer
- Change Layer Content
- Layer Content Options...
- Type
- Rasterize
- New Layer Based Slice
- Add Layer Mask
- Enable Layer Mask
- Add Layer Clipping Path
- Enable Layer Clipping Path
- Group with Previous   Ctrl+G
- Ungroup                Shift+Ctrl+G
- Arrange
- Align Linked
- Distribute Linked
- Lock All Layers In Set...
- Merge Layers           Ctrl+E
- Merge Visible         Shift+Ctrl+E
- Flatten Image
- Matting







- Gaussian Blur Ctrl+F
- Artistic
- Blur**
  - Blur
  - Blur More
  - Gaussian Blur...
  - Motion Blur...
  - Radial Blur...
  - Smart Blur...
- Brush Strokes
- Distort
- Noise
- Pixelate
- Render
- Sharpen
- Sketch
- Stylize
- Texture
- Video
- Other
- Digimarc



Layers Channels Paths History

Normal Opacity: 100%

Lock:

blur

Background

Bottom toolbar icons: Undo, Redo, Fill, Stroke, Layer, Layer Knocks Out Below, Layer Knocks Out Above, Layer Knocks Out Below and Above, Delete



### Gaussian Blur



OK  
Cancel  
 Preview

- 67% +

Radius:  pixels

A slider control for adjusting the radius value.

### Layers

Normal Opacity: 100%

Lock: [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

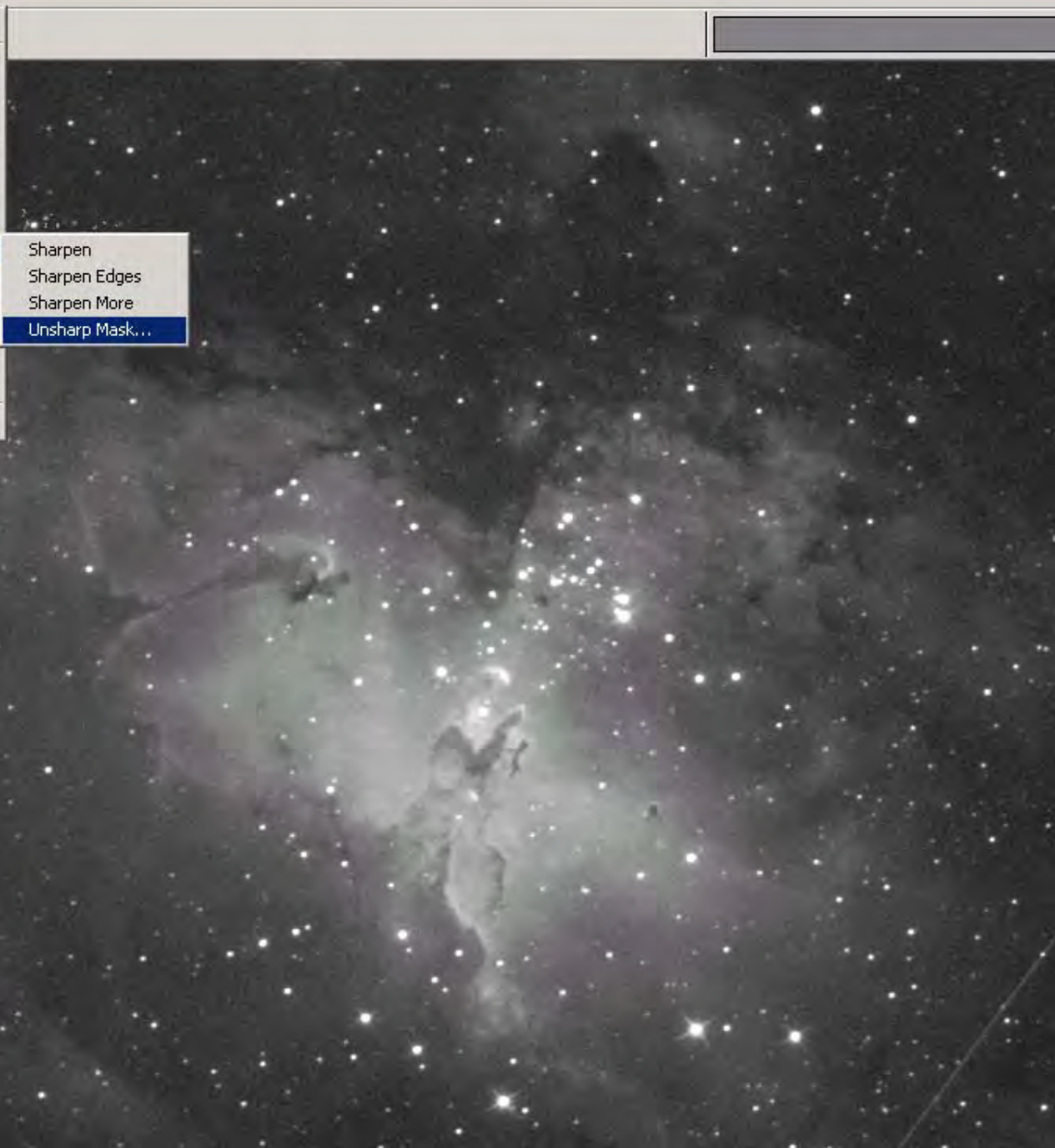
- blur
- Background

Layers panel showing the 'blur' layer selected and the 'Background' layer below it.

Actual Pixels Fit On Screen



- Gaussian Blur Ctrl+F
- Artistic
- Blur
- Brush Strokes
- Distort
- Noise
- Pixelate
- Render
- Sharpen**
  - Sharpen
  - Sharpen Edges
  - Sharpen More
  - Unsharp Mask...**
- Sketch
- Stylize
- Texture
- Video
- Other
- Digimarc



Layers Channels Paths History

Normal Opacity: 100%

Lock:

- sharpen**
- Background





### Unsharp Mask

OK  
Cancel  
 Preview

100%

Amount:  %

Radius:  pixels

Threshold:  levels

### History

hm16wo3.bmp

Open

**Duplicate Layer**

*Το τελικό αποτέλεσμα..*

Ha~130min, [R~4min, G~10min, B~12min] binned 2x2



ΚΑΛΕΣ ΦΩΤΟΓΡΑΦΙΕΣ



Ρίζος Φώτης