

Astronomical Wide-field Imaging System for Europe



An Alternate Cosmic-Ray Detection within Astro-WISE

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Currently within astro-wise there are two methods to detect and create masks for cosmic-rays:

- 1/ Using **SExtractor** (this is the default)
and its retina filter tool to produce an image map of the pixels classified as cosmic-rays.
- 2/ Using **CosmicFits**
A sophisticated filter to detect/mask/replace cosmic-ray events in images:
==> iteratively applies a 5 parameter Gaussian fit on pre-selected local maxima.

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```
class CosmicMapCosmicFITSParameters (CosmicMapParameters):
```

```
    'Parameters for processing CosmicMap objects, using CosmicFits
```

```
    CIRC_FWHM = persistent('fwhm limit for circular refit', float, 1.5 )
```

```
    CIRC_START = persistent('start width value for circular refit', float, 3. )
```

```
    CONFIDENCE_KAPPA = persistent("", float, 1.7 )
```

```
    COSMIC_FWHM = persistent('maximum fwhm for cosmic for smaller axis', float, 1.5 )
```

```
    ISOLATION = persistent('do not filter pixels with more than isolation NaN neighbors', int, 4)
```

```
    KAPPA = persistent('minimum amplitude for cosmic', float, 5.0 )
```

```
    MEDIAN_KAPPA = persistent('kappa for median filter', float, 4.5 )
```

```
    REPLACE_KAPPA = persistent("", float, 2.0 )
```

```
    SKY_OFFSET = persistent('already subtracted constant sky surface', float, 0.0 )
```

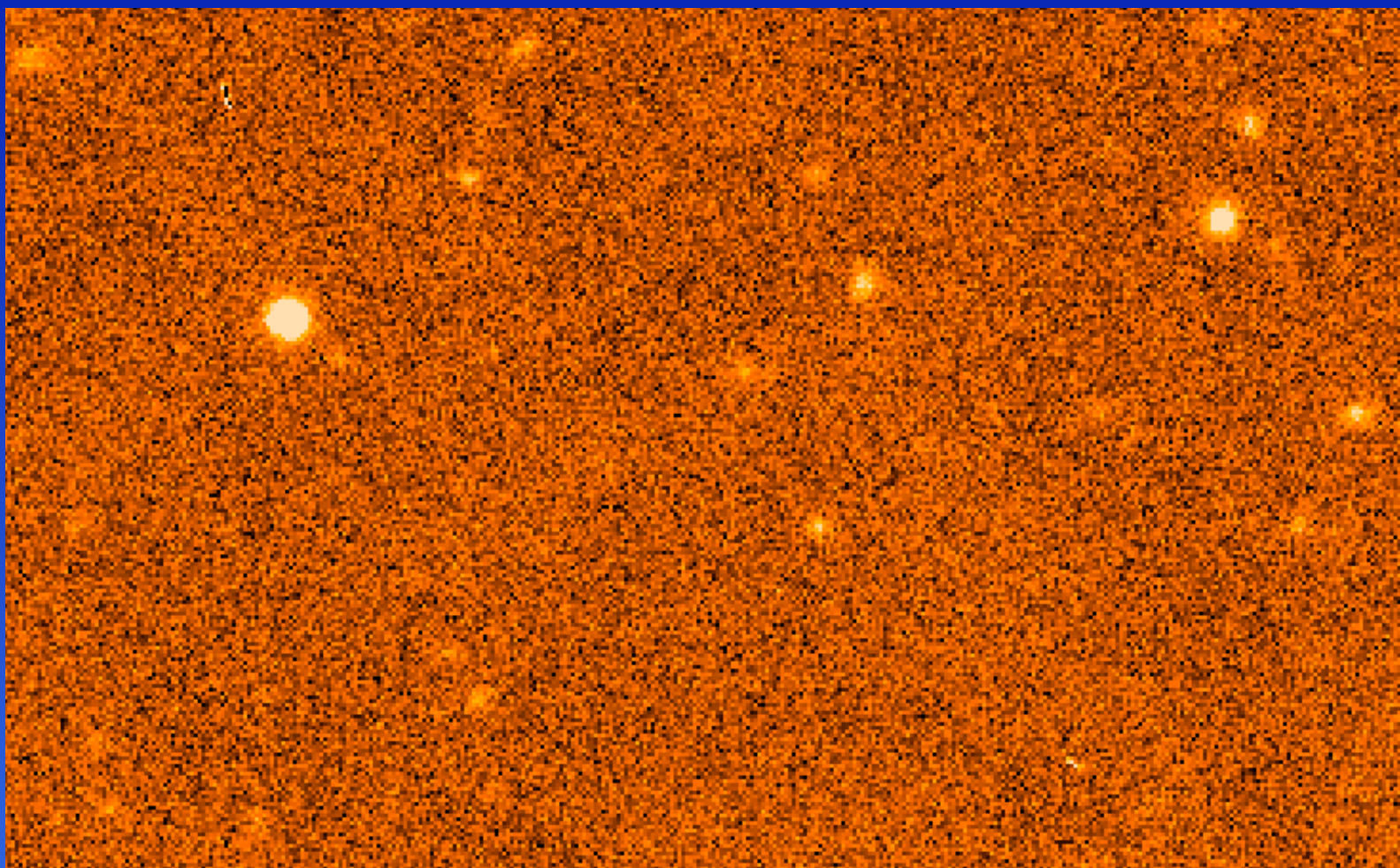
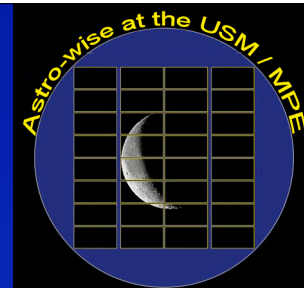
```
    SMOOTH_SCALE = persistent("", float, 5.0 )
```

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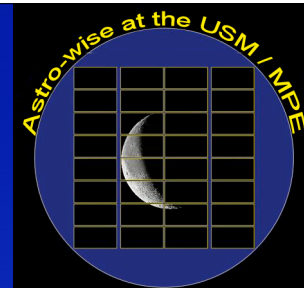
```
awe> from astro.main.CosmicMap import *
awe> help(CosmicMap)
awe> cosmic = CosmicMap()
awe> cosmic.frame = ReducedScienceFrame(pathname='your_very_favourite_science_frame.fits')
awe> cosmic.gain = GainLinearity()
awe> cosmic.gain.gain = 2.10
awe> cosmic.process_params = CosmicMapCosmicFITSParameters()
awe> cosmic.make()
```

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Zoom of frame processed/cleaned using SExtractor retina

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Further detections made using CosmicFits