

University of Groningen

## Efficient morphological tools for astronomical image processing

Moschini, Ugo

**IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.**

*Document Version*

Publisher's PDF, also known as Version of record

*Publication date:*

2016

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

Moschini, U. (2016). *Efficient morphological tools for astronomical image processing*. [Thesis fully internal (DIV), University of Groningen]. University of Groningen.

### Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

### Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

# Stellingen

behorende bij het proefschrift

## Efficient Morphological tools for Astronomical Image Processing

van

Ugo Moschini

1. When applicable, statistics and max-trees combined together reduce the cumbersome quest for parameters in connected filters.
2. Mask connectivity and viscous operators allow for selective clustering (or partitioning) of closely-spaced astronomical objects.
3. An efficient handling of spatial and intensity partitions of the image domain lets a novel max-tree parallel algorithm work on high bit-depth images.
4. Object recognition can be improved by exploiting the versatility of the component tree structure, in terms of using both noise models and parameter spaces built on morphological information.
5. Pattern spectra can be difficult to explain briefly, but they are in fact easy to implement, fast to compute on a max-tree and they do their job.
6. The viscous-hyperconnected filtering algorithm holds that sense of fulfillment that arises from turning a piece of theory into a usable algorithm.
7. An interest in humanities is what distinguishes a well-rounded scientist from just a skilled worker in science: it is fundamental not to lose sight of the bigger picture.
8. Holding meetings and brainstorming in front of a solar telescope raises both the levels of attention and of vitamin D.