

# Foreword

*The early 1980s marked a decisive turning point in observational astronomy. The habits of astrophotographers, passionate about capturing images of the sky, were transformed by the emergence of electronic detectors. Initially experimented with by only a handful of pioneers, this revolution gradually accelerated and it has become indispensable today.*

*Digital photography has become an essential tool. It not only preserves a tangible record of observations but also allows one to share results, to push personal limits with every new capture, and even to embark on a scientific approach. The range of equipment available for this astronomical practice is wide and appealing: from consumer cameras to powerful specialized imaging devices, and even smartphones whose low-light performance continues to improve.*

*Before the advent of electronic detectors, astronomical images were developed chemically, offering almost no possibility of intervening in the final result. Everything depended on the moment of capture. With digital imaging, the principle of revealing the image remains, but it now occurs in a non-destructive way. Computer processing makes it possible to calibrate, correct, and refine the images as many times as needed, and in a very short time. Experimentation at the computer screen thus becomes an activity in its own right, providing endless possibilities for adjustments and optimization.*

*To appreciate how far we have come, one must remember that the rise of digital sky imaging coincided with the growth of computing. The*

*pioneers of the time had to work with rudimentary and fragile equipment. I was one of them, which allows me to appreciate even more the quality of today's tools, of which the Siril software is a perfect example.*

*At that time, the first camera I built myself produced images of only 64 x 64 pixels, a negligible format compared to today's standards. This choice was dictated by the computers of the era, forcing us to write processing programs in assembly language, the closest to the microprocessor. Saving even a single byte of memory was a real achievement. Imagine programming an algorithm such as the unsharp mask under those conditions, especially when we were unaware of its existence, as the available literature was almost nonexistent.*

*To display our images, we only had black-and-white screens with no intermediate shades. We had to resort to tricks, imitating the halftoning technique used in newspapers of the time, to simulate a few levels of gray and make the images barely readable. The field of image processing was so unexplored that the first software I wrote bore a straightforward name: TI, for Traitement d'Image (Image Processing in French). Those were times when each new need required inventing a new solution, when everything had to be built from scratch. Some traces of that era remain in modern software.*

*Today, the situation has completely changed. Technical limitations in image processing have almost disappeared, opening up a fascinating field of exploration, a true playground where*

*almost anything seems possible. Yet this freedom, as exhilarating as it may be, can sometimes lead to excesses or even to pitfalls. For example, it would be illusory to believe that an algorithm, no matter how sophisticated, could reveal a magnificent image if the raw data are of poor quality. Believing so would amount to embracing a form of complacency that hinders personal progress. Image processing is only one link in a much larger chain, where the experience and skill of the observer, as well as the quality of the equipment used, whether modest or not, play an equally decisive role.*

*It is just as essential to respect the image that Nature offers us, without distorting it under the pretext of improvement. To illustrate this point, imagine a world plunged into absolute silence, without the slightest sound. How long could you endure before that absence became oppressive, even unbearable? In the same way, sterilizing an image by removing all visible noise strips it of its essence, producing a cold representation similar to what a poorly used Artificial Intelligence might generate. What, then, would be the purpose of observing? Noise is life. It is omnipresent in nature, in infinitely varied forms.*

*Of course, it is legitimate to reduce noise in an image, and we possess powerful tools for doing so. But it must be done with discernment, with a clear understanding of the subtleties of the signal being handled, and without erasing what constitutes its richness. Worse still would be to introduce artifacts that never existed.*

*The author of these words likely belongs to a school of thought that still cherishes the grain of film photography. But beyond simple aesthetics lies a deeper truth. It is often within the noise that major observational discoveries emerge, by detecting subtle clues that go unnoticed at first glance. Conversely, smoothing an image until it takes on the uniform appearance of plastic confines us to the role of mere spectators instead of engaged explorers of reality. It is a choice one must make.*

*Through the way the Siril software is designed, and through the manner in which it is described in this book, you begin with solid foundations that guide you in avoiding these pitfalls. Its author, Cyril Richard, knows these dangers perfectly well and demonstrates the scientific rigor essential to any good researcher. You thus have at your disposal a set of essential, proven, and effective tools, a true force for analyzing your observations*

*in depth and making the most of them, whether your goals are aesthetic, scientific, or both.*

*In this sense, Siril follows the principles I have always believed define a good astronomical image-processing software: a powerful yet controlled tool, serving the observer rather than manufacturing illusions. Its purpose is not to embellish artificially but to extract the full potential of the collected data, while respecting the reality observed. Siril succeeds thanks to its methodical and rational approach.*

*What I particularly appreciate in Siril is the presence of fundamental functions which, once combined, allow powerful operations while providing a fine understanding of the process. This subtle balance between low-level and high-level tools gives the user considerable freedom. Moreover, a scripting language enhances the system further, offering even greater flexibility. It is up to you to remain vigilant and avoid the pitfalls mentioned earlier, but once again, Siril provides an ideal framework for working with rigor and method.*

*The organization of the software is exemplary. It is based on a fundamental principle: what is well designed is easily understood. The interface is both streamlined and logical, qualities that often go hand in hand, and stands in contrast to the unwieldy systems where an excess of features becomes an obstacle, sowing confusion and inefficiency. Siril manages to be both feature-rich and simple to use, a testament to the vision and expertise of an experienced practitioner.*

*This book is a true treasure trove of information, one you can draw upon whenever questions arise or whenever doubts emerge about the best way to proceed. But beyond its technical content, what shines through its pages is the author's deep respect for the users of Siril and his pedagogical commitment. With patience and clarity, he guides them step by step through the art of processing astronomical images.*

*Having this book in your hands is an opportunity that should be appreciated at its true worth. I cannot help but think how different my own journey as an amateur astronomer might have been, had I had access to Siril when I began imaging the night sky so many years ago. My sincere congratulations and gratitude to Cyril.*

**Christian Buil**