

## *Getting the best resolution of a telescope without AO*

Jean-Luc Dauvergne<sup>1</sup>

<sup>1</sup> AFA / Ciel et Espace, France

**Contact : [jl.dauvergne@cieletespace.fr](mailto:jl.dauvergne@cieletespace.fr)**

Amateur astronomers produce a large amount of planetary observations that are shared with professionals as part of citizen science programs. Observation techniques in this field have made significant progress in recent years, thanks to improvements in cameras and software. The technique involves capturing as many images as possible of a target, using what's called *lucky imaging*. This method consists of selecting a percentage of the best frames to counteract atmospheric disturbances.

Amateur astronomers are often able to reach the resolution limits of their telescopes in the visible part of the spectrum—typically between 0.1 and 0.5 arcseconds. Of course, the Hubble Space Telescope and many professional observatories can achieve even better resolution, but none of them can observe Jupiter, Saturn, or Mars every day and almost every hour during their period of visibility. This regular monitoring has led to many important discoveries over the past 15 years.

Reaching such a level of resolution is always a technical challenge, as the observer must manage a variety of issues: optical alignment, atmospheric refraction, thermal equilibrium of the telescope, and more.