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Monitoring non-periodic comet C/2011 L4 PANSTARRS using Joan Oró 0.8m robotic telescope at OAdM

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Abstract

Comet C/2011 L4 PANSTARRS was discovered in June 2011 by R. Wainscoat and D. Tholen using the Pan-STARRS telescope located near the summit of Haleakala, on the island of Maui in Hawaii (USA) [1]. Once its orbit was computed it was noticed its non-periodic nature and the favorable geometry during its approach to perihelion in March 2013. It first became visible to the naked eye from the Southern hemisphere, and later on it started to be seen during mid-March from the Northern one. Due to the limited observational period in right conditions we introduce here some observations obtained taken from robotic 0.8 m Telescope Joan Oró (JO) from the Observatori Astronòmic del Montsec (OAdM: www.oadm.cat) and other Spanish observatories.

1. Introduction

Observations summarized here basically started in the first weeks of March, just when it passed closest to Earth on 5 March 2013 at a distance of 1.09 AU [2]. It came to perihelion (closest approach to the Sun) on 10 March 2013. Initial estimates predicted the comet would brighten to roughly apparent magnitude 0, but further ones were far more optimistic predicting the comet might brighten to magnitude -4. In January 2013 there was a noticeable brightening slowdown that suggested the comet may only brighten to magnitude +1. During February the brightness curve showed a further slowdown suggesting a perihelion magnitude of around +2 [3]. It is nicely exemplifies how difficult can be predicting the magnitude of a comet. The orbital geometry provided us a second chance as the comet was again favorable to be observed from the Northern hemisphere in May 2013. Fortunately this time the comet was observed in highest elevation so it was targeted by our 0.8m JO telescope at OAdM.

2. Observational data.

We are conducting a ground-based monitoring program of this comet. Our main goals are tracing the nuclear activity, obtaining accurate astrometric observations, and performing standard Johnson-Cousin photometry following the method explained in [2]. Involved observatories are listed in Table 1.

Table 1: Observatories involved in the follow-up.

Observatory (MPC code)	Instrument
Gualba, Barcelona (442)	SC 36.0 f/7
Guadarrama, Madrid (458)	SC 25 f/10
La Cañada, Ávila (J87)	RCT 40.0 f/10
Montseny (B06)	T 20 f/6
Montsec Ast. Obs., OAdM (C65)	RCT 80.0 f/9.6

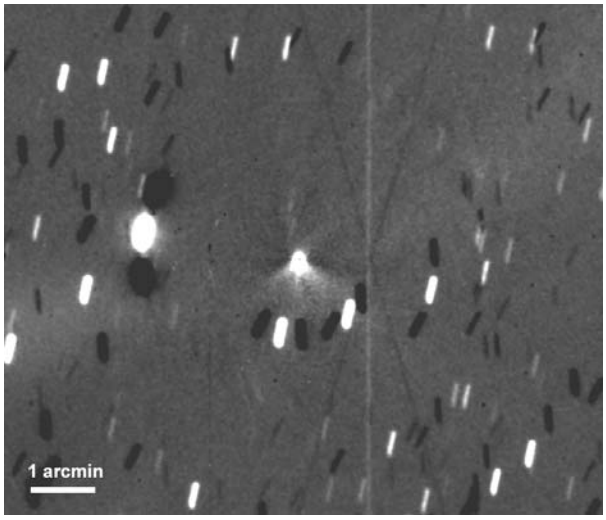

Figure 1: A Larson-Sekanina filter of the comet image shown in Fig. 2 reveals several jets. Taken from OAdM Joan Oró 0.8 m telescope on May 12.072, 2013.

3. Preliminary results

The comet has evolved significantly since our first March observations. It has developed a fan-like structure, and during May has shown an anti-tail oposed to the regular dust tail. Our Fig. 2 exemplifies the quality of the last OAdM observations taken in good geometric circumstances. That post-perihelion picture was taken with the comet at an Earth distance Δ=1.632 A.U. and about 1.495 A.U.from the Sun. Its shows a regular trail in a position angle (PA) of 310º, while the anti-tail is in PA~98º. The comet has a really interesting internal structure that could reflect several active regions in the comet nucleus. C/2011 L4 PANSTARRS will follow increasing its elongation and consequently we will be able to study its behavior and reconstruct its post-perihelion photometric curve in detail.

Acknowledgements

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References

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Figure 2. C/2011 L4 PANSTARRS taken from 0.8 m JO telescope OAdM Observatory on May 12.072, 2013. This image covers about 12.3 arcmin with the North up, and the East left.