New Trends in the Discovery of Comets by Amateurs

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Abstract

The ways in which amateurs may increase their chances of discovering comets were described. Amateurs discover a considerable proportion of comets, but their contribution is greater among long-period comets. The relative proportions of short-period comets is revealing: 1 in 2 for professional astronomers, 1 in 8 for amateurs. Professional discoveries are largely a by-product of searches for asteroids: the comets have low inclinations ($i < 30°$) and are faint ($m_1 > 14$). Amateurs are most successful in areas close ($< 60°$) to the Sun. Typical apertures are 150-mm, and most comets are brighter than magnitude 10.

Past results show that there is a strong correlation between number of observers and number of discoveries. Several amateurs have discovered comets at great elongations with larger telescopes (≥ 400 mm). The comets tend to be fainter ($10 < m_1 < 12$). Several comets have been discovered with simple equipment (200- or 300-mm telephoto lenses) down to magnitude 13.

Calculations of the distribution of discoverable comets show that an average of 14 comets ($9 < m_1 < 14$) are missed per year.

References

Kresak, L., 1982: "Comet discoveries, statistics, and observational selection" in *Comets*, ed. Wilkening, L.L., 56–82
Everhart, E., 1967: "Intrinsic Distribution of Cometary Parhelia and Magnitudes", Astron. J., **72** (8), 1002–11
[*See also* the invited paper by B. Marsden – Eds.]

Amateur Astronomers and the Recovery of Periodic Comets

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Abstract

Most periodic comets are recovered by professional astronomers at faint magnitudes (18–21). Only Tsutomu Seki, using a 60-cm telescope has been an exception to this rule. Amateurs having access to large telescopes (such as the T 60 at Pic du Midi) now stand a chance of success. For example, using the T 60, the author photographed P/Halley at mag. 19–20 on forming-gas hypered Kodak TP 2415 in a 1-hour exposure. Experiments by C. Buil suggest that the same telescope can reach magnitudes 21–22 with a CCD array cooled to −50°C and a 30-minute integration time.

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[*See also* the paper by C. Buil on the use of CCDs – Eds.]

Shape and Frequency of Outbursts of P/Schwassmann-Wachmann 1

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Abstract

Observations made since the comet's discovery (1927) were analyzed and reduced to remove observational bias. Comparison was made with possible mechanical effects on the nucleus (tidal forces, impacts). The observations appear to best fit an internal mechanism (exothermic chemical reactions) as proposed by Whipple.

[The text of this paper was received, but was of such extreme length that it could not be included in full, as the author requested. – Eds.]

Astrometry of Comet Halley

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[This contribution was delivered, but neither text nor abstract have been received. – Eds.]

Observation and Analysis of Comet Tails

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Abstract

Details of H_2O and dust production in P/Halley are mainly derived from amateur observations of cometary tails, leading to a gas/dust mass-ratio. The rotational period (2.21 day) is also found from amateur observations. Velocity and acceleration of the plasma and velocity and direction of the solar wind are also derived, together with size and indications of the mass-distribution function for dust particles.