THE PLANET COLLABORATION

Probing Lensing Anomalies with a world-wide NETwork

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Abstract. A newly-formed microlensing monitoring network, the PLANET collaboration, is briefly described.

PLANET (**P**robing **L**ensing **A**nomalies **NET**work) is a worldwide collaboration formed in the spring of 1995 to meet the challenge of microlensing monitoring. Its primary goal is the study of microlensing anomalies — departures from an achromatic point-source, point-lens light curve — through rapidly-sampled, multi-band, photometry. Such departures are expected due to blends along the line-of-sight, sources and/or lenses with complex geometries (e.g., binary lenses and sources), resolution of the source star, and complicated relative motion within the lens system (e.g., parallax effects). In particular, microlensing monitoring is a powerful means of searching for extra-solar planets: the caustic patterns arising from the complicated lens geometry of a planetary system could induce sharp peaks in the light curve with durations of a few hours to a few days. Depending on the planetary masses and orbital radii, a significant fraction of detectable caustic crossings are expected (Mao & Paczyński 1991, Gould & Loeb 1992), and in principle, even earth-size planets can be detected in this way.

Our first campaign is now in progress. With dedicated access in June-July 1995 to a suite of southern telescopes, we are monitoring several ongoing bulge events per night in the direction of the Galactic center. The large number of microlensing alerts issued by the MACHO (Pratt et al. 1995) and OGLE (Udalski et al. 1994) teams has kept the PLANET tele-

C. S. Kochanek and J. N. Hewitt (eds), Astrophysical Applications of Gravitational Lensing, 227–228.
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https://doi.org/10.1017/S0074180900231343 Published online by Cambridge University Press

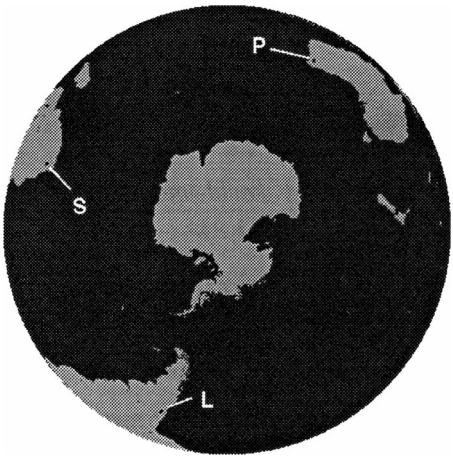

Figure 1. The PLANET 1995 bulge campaign is being conducted with three widely separated southern telescopes: **P**: Perth Observatory 0.6m at Bickley, Australia, **S**: South African Astronomical Observatory 1.0m at Sutherland, South Africa, and **L**: Dutch-ESO 0.9m at La Silla, Chile.

scopes busy whenever the bulge is visible. The telescopes are widely separated in longitude (Fig. 1), giving us the possibility of nearly continuous monitoring and a hedge against bad weather: to date, at least one PLANET telescope has collected useful data in every 24-hour period. In the current campaign, we sample the light curves every 1–2 hours, and are experimenting with higher sampling rates. The monitoring is done in the V and I bands. By performing preliminary crowded-field photometry at each observing site against a set of common secondary standards in each field, we are able to track the progress of the events in real time. Through extensive analysis of this season's large, high-quality data set, we expect the capabilities of PLANET to grow as we refine our strategies for future campaigns.

Acknowledgements: The PLANET collaboration wishes to thank the MACHO and OGLE teams for their dedication in providing prompt, electronic alerts of microlensing events. P.D.S. acknowledges the Leids Kerkhoven-Bosscha Fonds and the International Astronomical Union for travel support to Melbourne.

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https://doi.org/10.1017/S0074180900231343 Published online by Cambridge University Press