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Black Holes, Neutron Stars and White Dwarf Candidates from Microlensing with OGLE-III

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Most stellar remnants so far have been found in binary systems where they interact with matter from their companion. Isolated neutron stars and black holes are hard to find as they do not emit light, yet they are predicted to be present in our Galaxy in vast numbers.

We explored the OGLE-III database of 150 million objects observed in years 2001-2009 and found 59 microlensing events exhibiting parallax effect due to Earth's motion around the Sun. Combining parallax and brightness measurements from microlensing light curves with expected proper motions in the Milky Way, we identify 15 microlensing events which are consistent with having a white dwarf, neutron star or a black hole lens and we estimate their masses and distances. The distribution of masses of our candidates indicates a continuum in mass distribution with no mass gap. We also present predictions on how such events will be observed by the astrometric Gaia mission.

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