



# An Anomaly in the Angular Distribution of Quasar Magnitudes: Evidence for a Bubble Universe with a Mass $\sim 10^{21} M_{\odot}$

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Quasars provide our farthest-reaching view of the Universe. The Sloan Survey now contains over 100,000 quasar candidates. A careful look at the angular distribution of quasar magnitudes shows a surprising intensity enhancement with a "bull's eye" pattern toward  $(\alpha, \delta) \sim (195^{\circ}, 0^{\circ})$  for all wavelengths from UV through infrared. The angular pattern and size of the enhancement is very similar for all wavelengths, which is inconsistent with a Doppler shift due to a large peculiar velocity toward that direction. The shift is also too large to explain as a systematic error in the quasar magnitudes. The general features of the anomaly can be explained by the gravitational lensing of a massive bubble with  $M_{\text{lens}} \sim 10^{21} M_{\odot}$ , a lens radius  $\sim 350$  Mpc, and with the lens subtending an angle of  $\sim 15^{\circ}$  on the sky. It is remarkable that the presence of such a massive bubble universe can explain not only the anomalies in the angular distribution of quasar intensities, but also anomalies in the distribution of luminous red galaxies, anomalies in the CMB, and bulk flow discrepancies, all of which appear in roughly the same direction.

Comments: Small changes and correction of a couple of typos. arXiv admin note: substantial text overlap with [arXiv:1112.5045](#)

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