GALACTIC CENTRE

Feeding frenzy has faded

Astrophys. J. Lett. **888**, L2 (2020)

There are enough mass-losing evolved stars within one parsec of the Galaxy's central black hole (BH), Sgr A*, to keep it well fed, according to simulations run by Diego Calderón and colleagues. The fact that Sgr A* is accreting material at such a slow rate therefore has two implications: that the material ejected by the tens of evolved Wolf–Rayet stars is being concentrated into a reservoir of gas — and this fits with recent observations of relatively cold (10,000 K) gas in the Galactic Centre; and that perhaps the feast is now over — net accretion onto the BH via the gas reservoir is regulated ($<10^{-7}$ $M_{\odot}$ yr^{-1}), and so what we are seeing is the post-feasting repose of Sgr A*.

The 3D hydrodynamical simulations of Calderón et al. show that Wolf–Rayet stars lose 10^{-3} $M_{\odot}$ yr^{-1} overall, but after just a few thousand years, rather than falling directly into Sgr A*, that material accumulates close to Sgr A*, forming a disk. A few thousand years is a very short period in the lifetime of a Wolf–Rayet star, less than 3% of the total, so it is likely we are currently in this disk-mediated stage. Other recent hydrodynamical models have missed this step-change because they only considered the most recent history of Sgr A* (the last ~1,100 years).

Consideration of the evolved star contribution alone is sufficient in the simulation to reproduce much of the behaviour of the central part of the Galaxy in the last thousand years, and therefore there is no need for the other sources of infalling gas that have been suggested in the literature (including a tidal disruption event, supernova and the Sgr A West 'minispiral').

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Published online: 3 February 2020
https://doi.org/10.1038/s41550-020-1027-1