

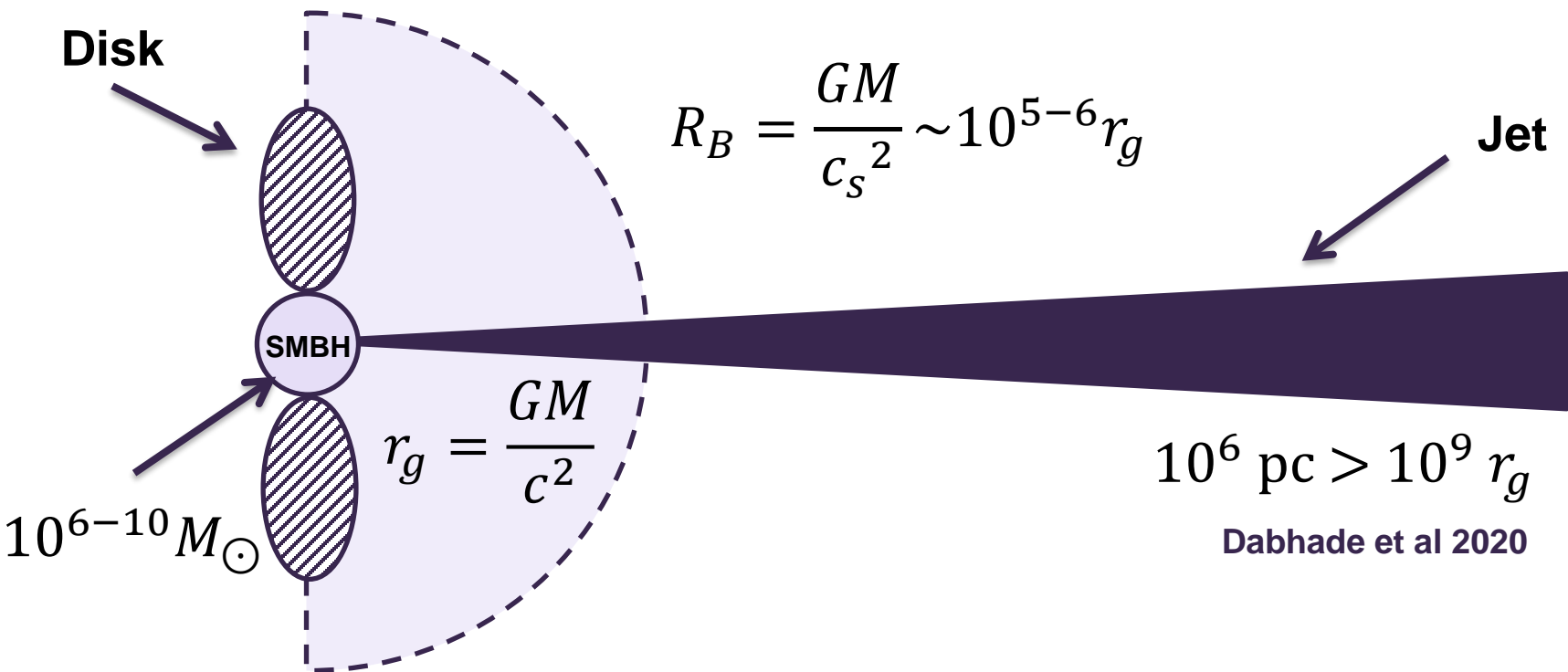


How to turn jets into cylinders?

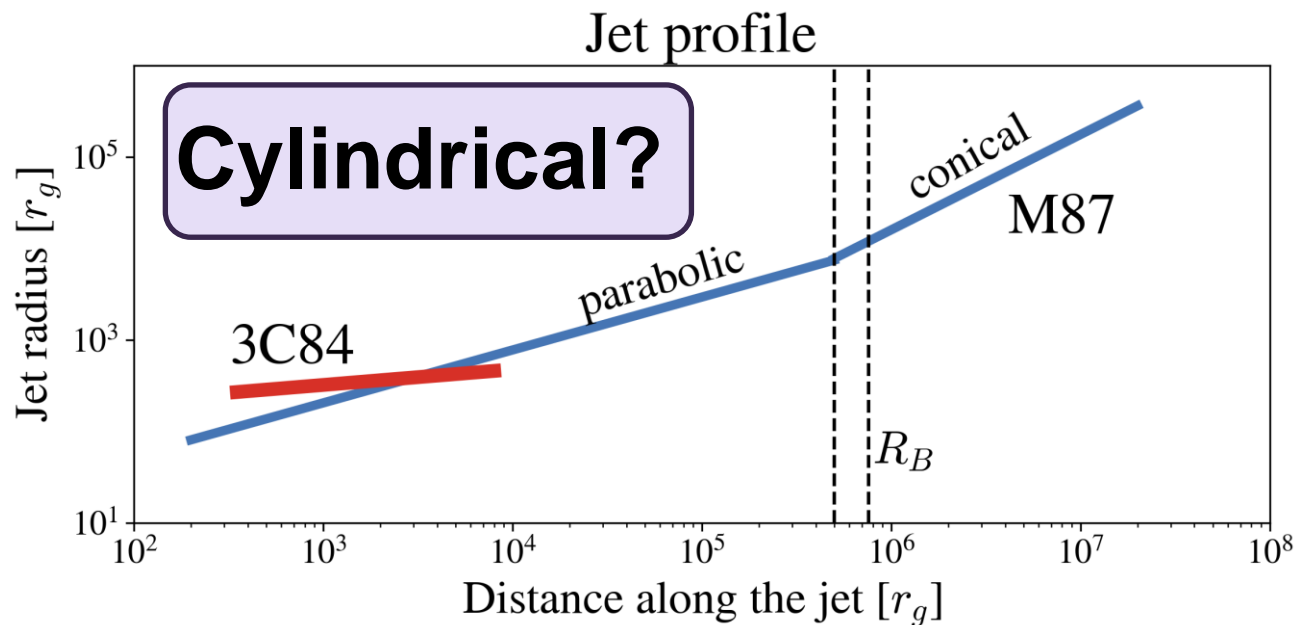
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with Max Paik, Aris Lalakos, Koushik Chatterjee,
Sasha Tchekhovskoy, Matthew Liska

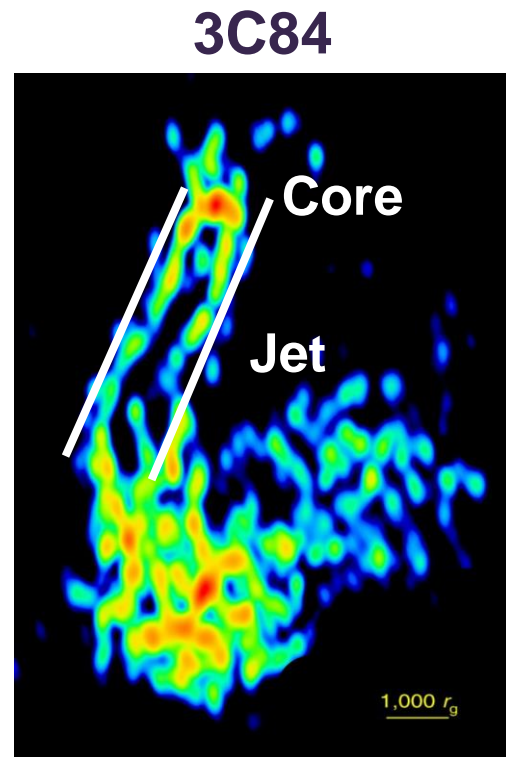
Relativistic jets can span up to 1 Mpc



Cylindrical jets are observed at $\sim 10^2 - 10^3 r_g$



Adapted from Asada et al 2011

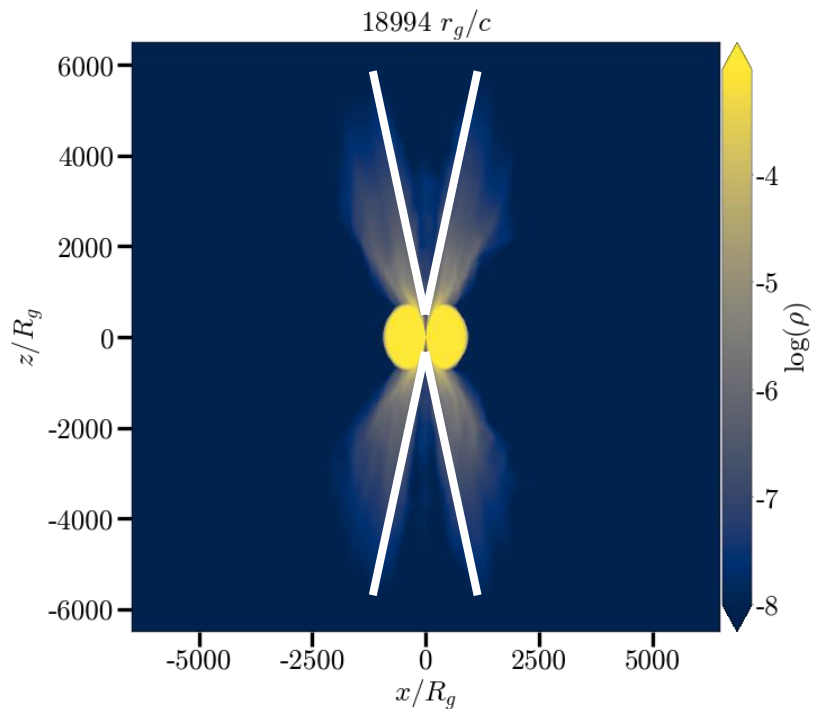


Giovannini et al 2018

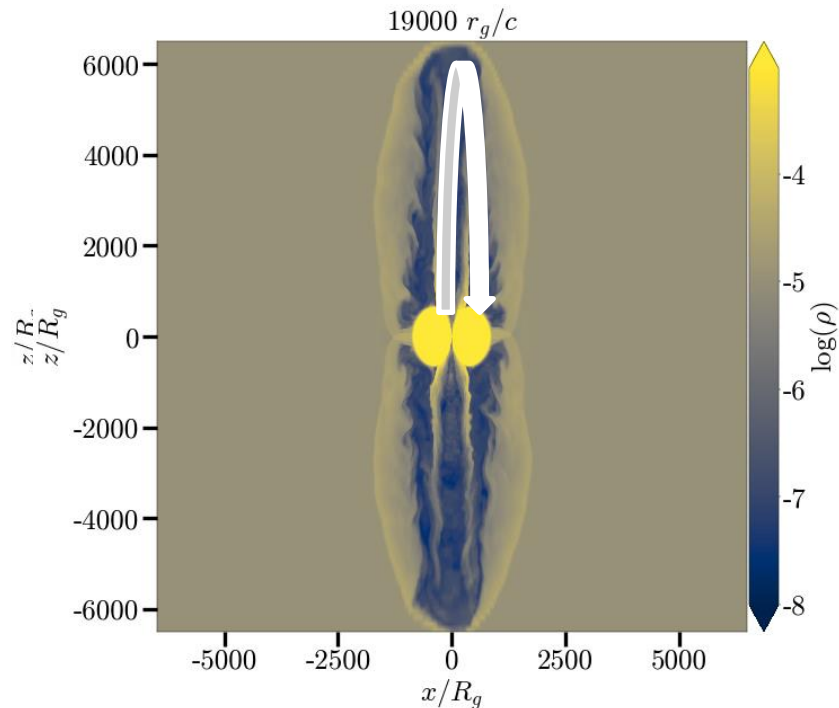
**What can make jets
cylindrical?**

How to restrict the jets' expansion?

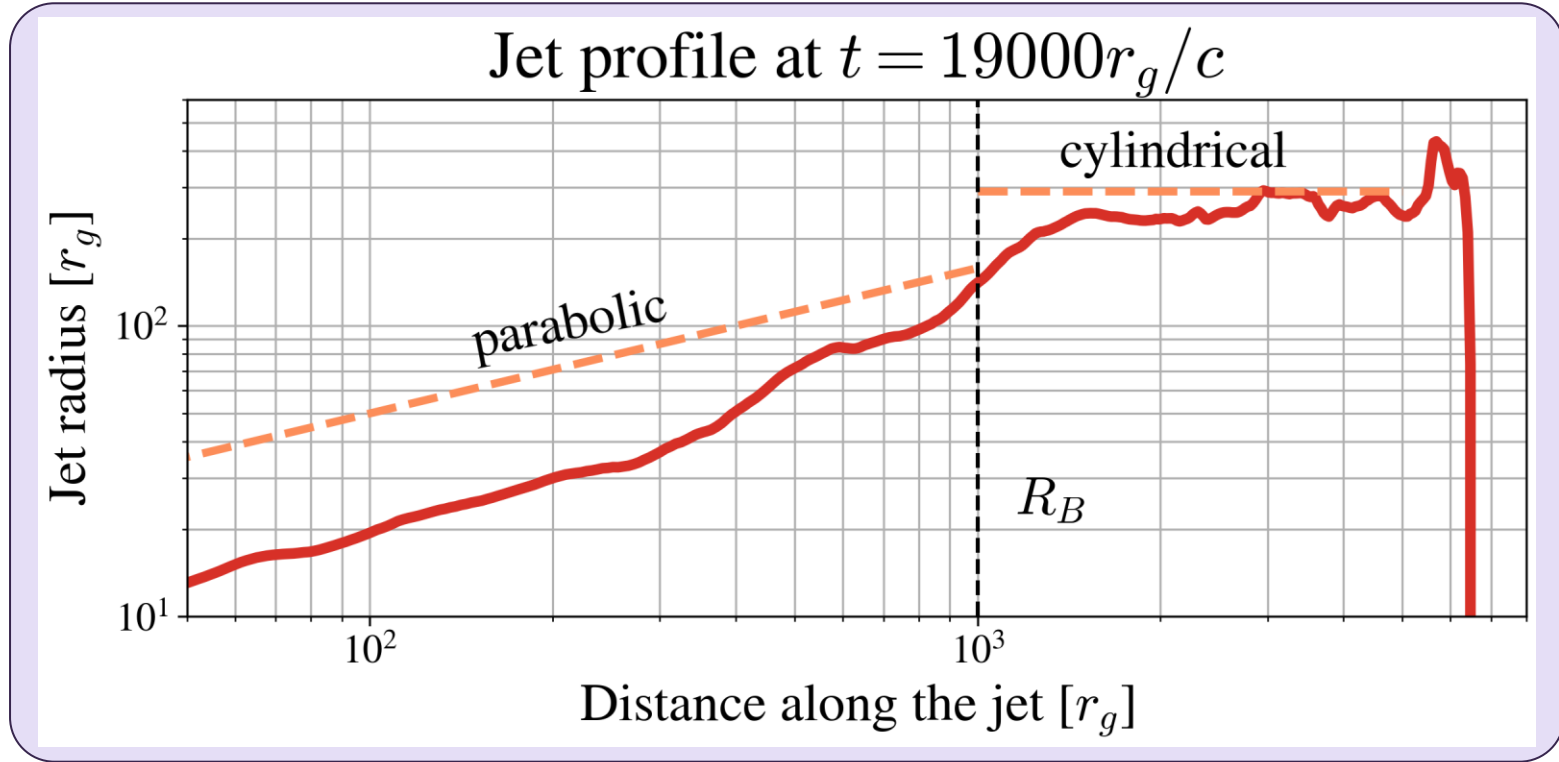
Without ambient medium



With ambient medium

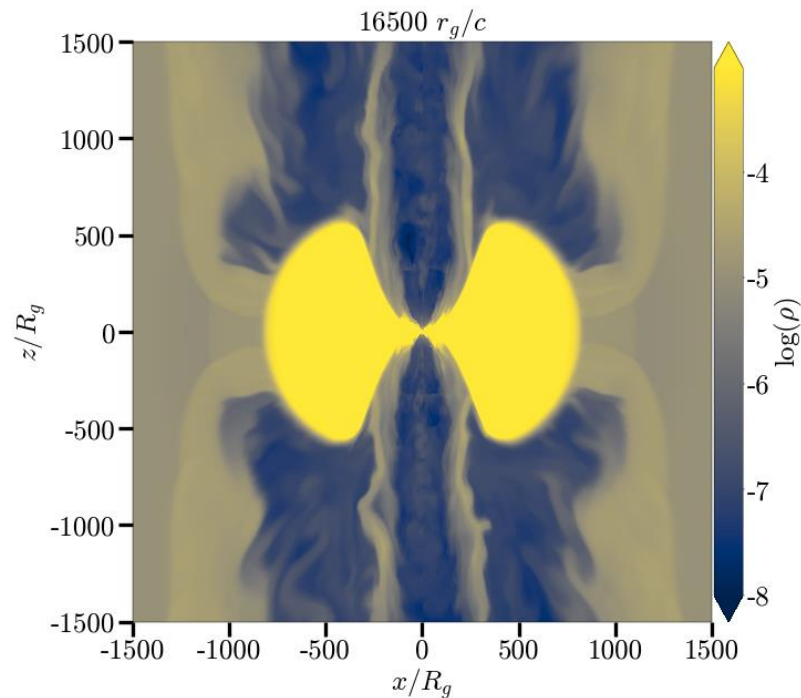
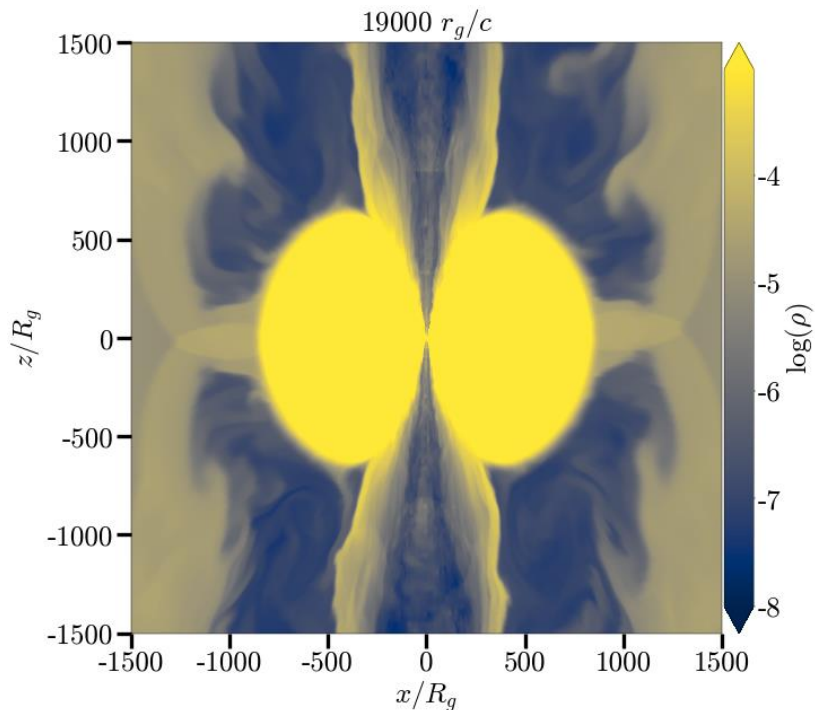


Jets become cylindrical at $\sim 10^3 r_g$

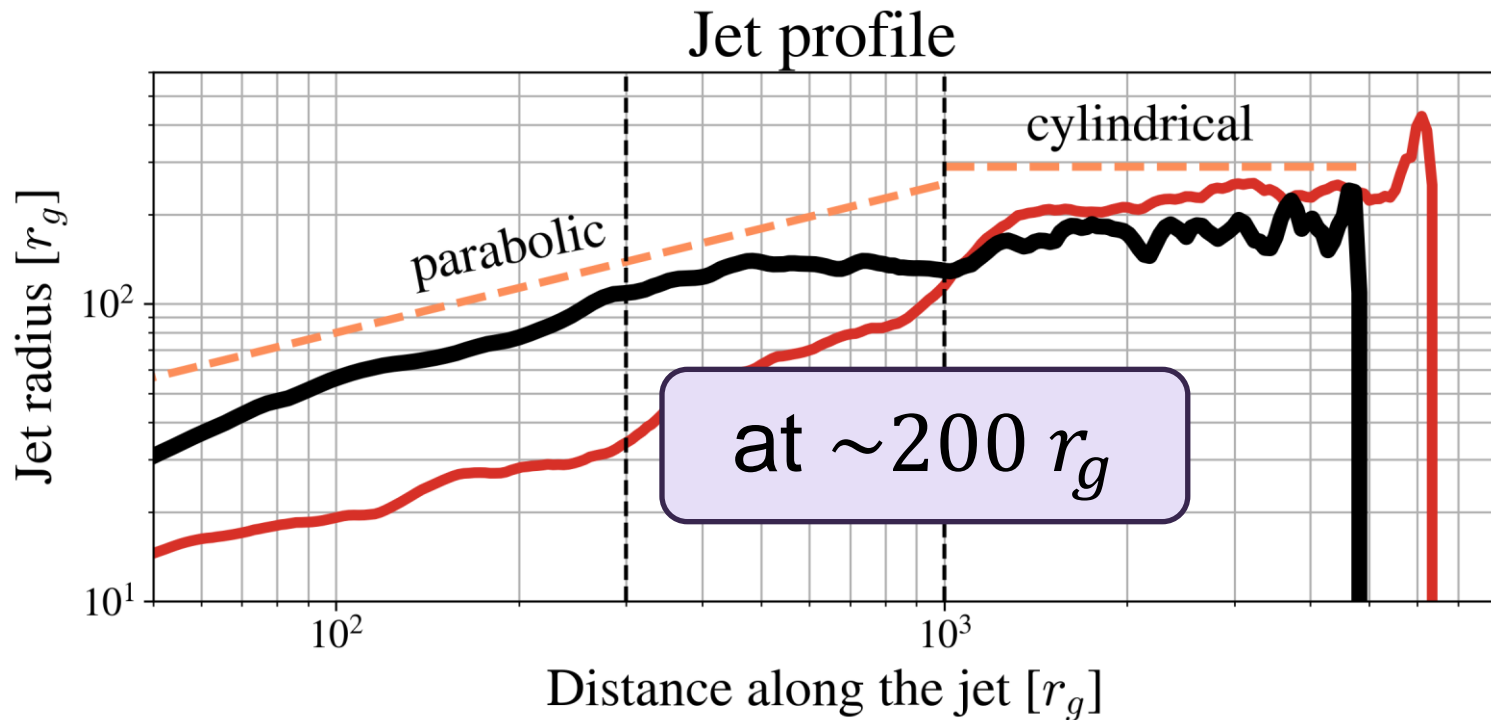


A cylindrical shape even closer?

Disk cooling



Disk cooling allows backflows to reach the jet base

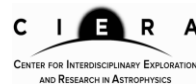


- Interaction with the ambient medium removes the jet material and forms backflows
- Backflows turn the jets into cylinders
- Disk cooling reduces the distance at which the jets become cylindrical

Next steps:

How to reduce the scales even more?

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Effective resolution: $2304 \times 2048 \times 1536$ in r, θ, φ

