

## Gris paper notes (Spotlight article)

Observed scaling:  $j \sim R^{3/2}$

$$j = \frac{I\omega}{m} = r^2\omega$$

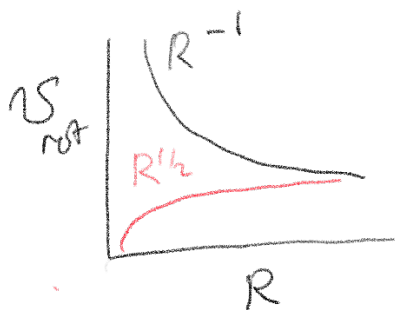
$$\text{So } j \sim r^{3/2} \Rightarrow \boxed{\omega \sim r^{-1/2}}$$

$$\text{Linear speed: } v = r\omega \quad \underline{\text{OR}} \quad v = \frac{j}{R} \\ \Rightarrow v \sim r^{1/2}$$

As opposed to conservation of angular momentum:

$$j = \text{constant} \Rightarrow \omega \sim r^{-2}$$

$$\Rightarrow v \sim r^{-1}$$



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Rotational to gravitational

$$\text{energy: } U_{\text{rot}} = \frac{1}{2} I \omega^2 = \frac{1}{2} m R^2 \omega^2$$

