

Siddhartha Mishra (MIT/Alfi) Summer School



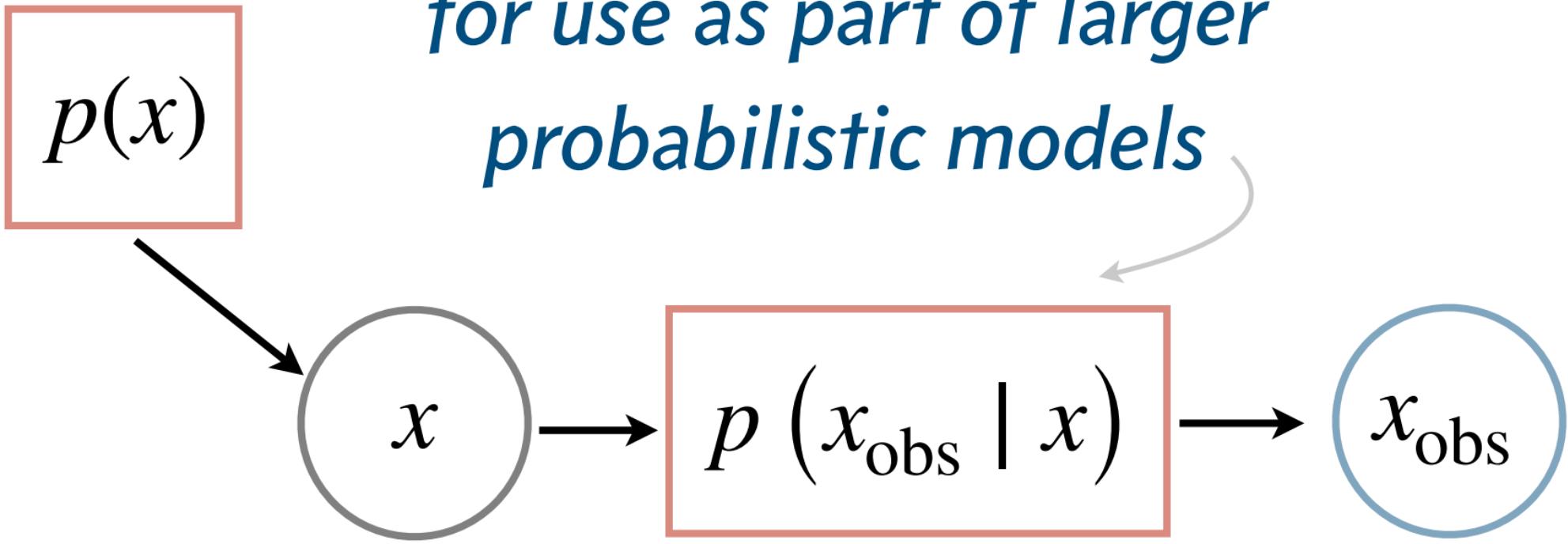


What could we do with $p(x)$?

can efficiently generate a wide variety of scientific models for a variety of applications.

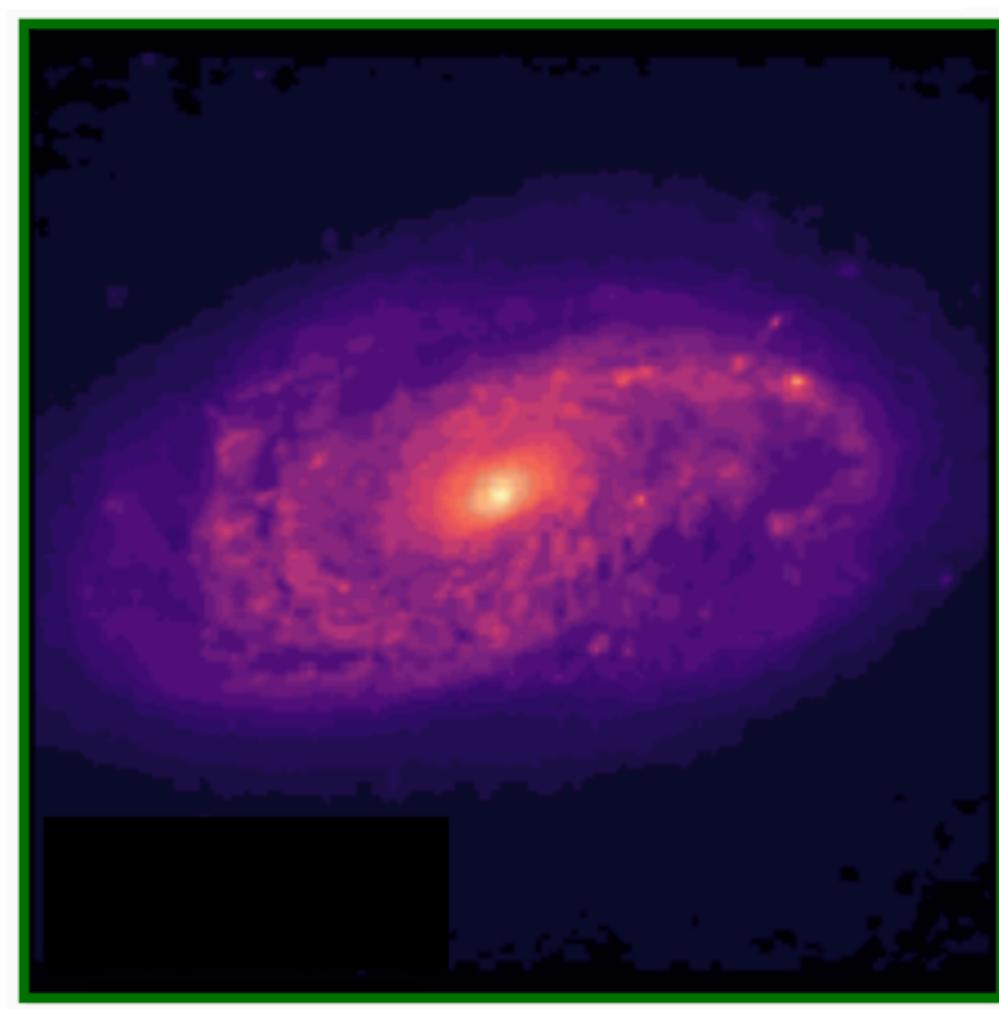
Encode complex priors

*for use as part of larger
probabilistic models*

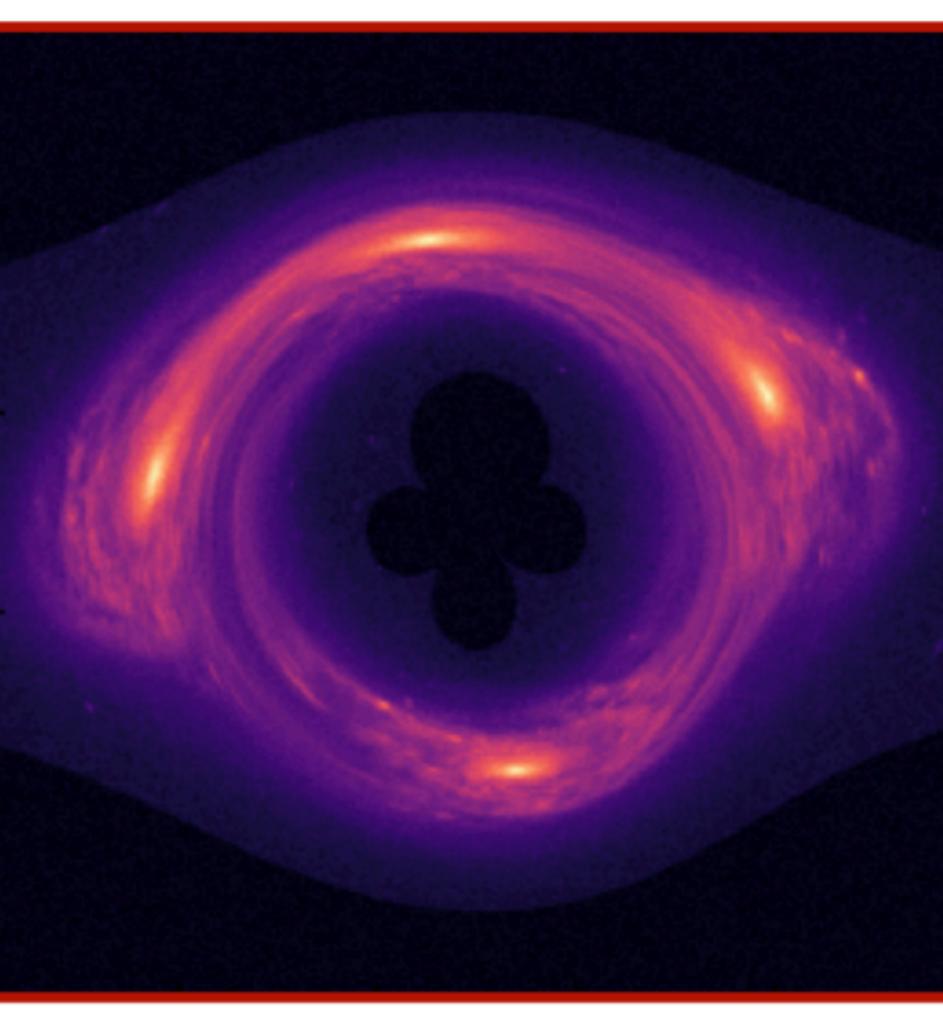


$p(\text{galaxies})$



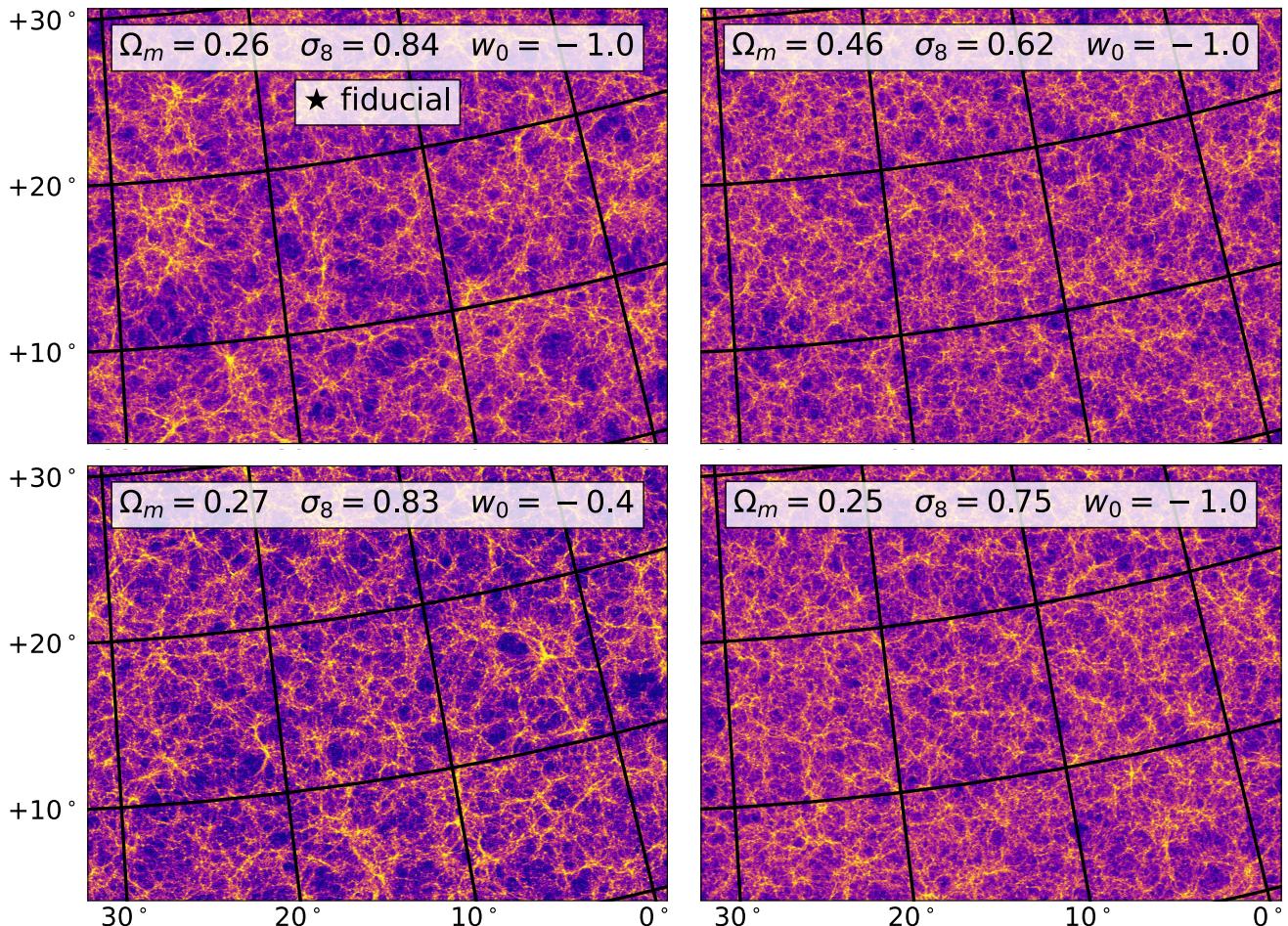


Lens



Produce samples for downstream applications: a fast simulator/emulator

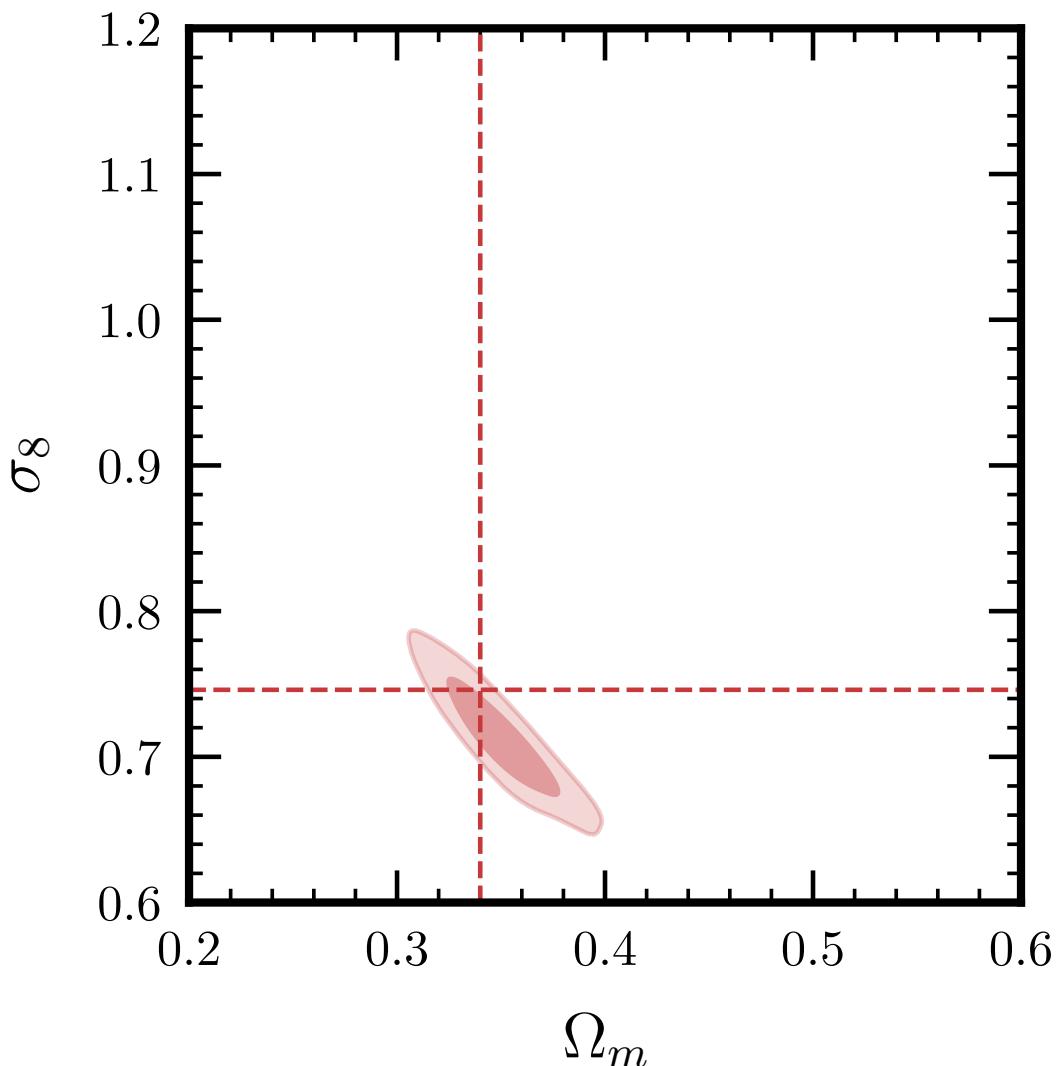
$$x \sim p(x \mid \theta)$$



Evaluate likelihood

for model selection, parameter inference, outlier detection, ...

$$p(\theta \mid x) = \frac{p(x \mid \theta) \cdot p(\theta)}{p(x)}$$

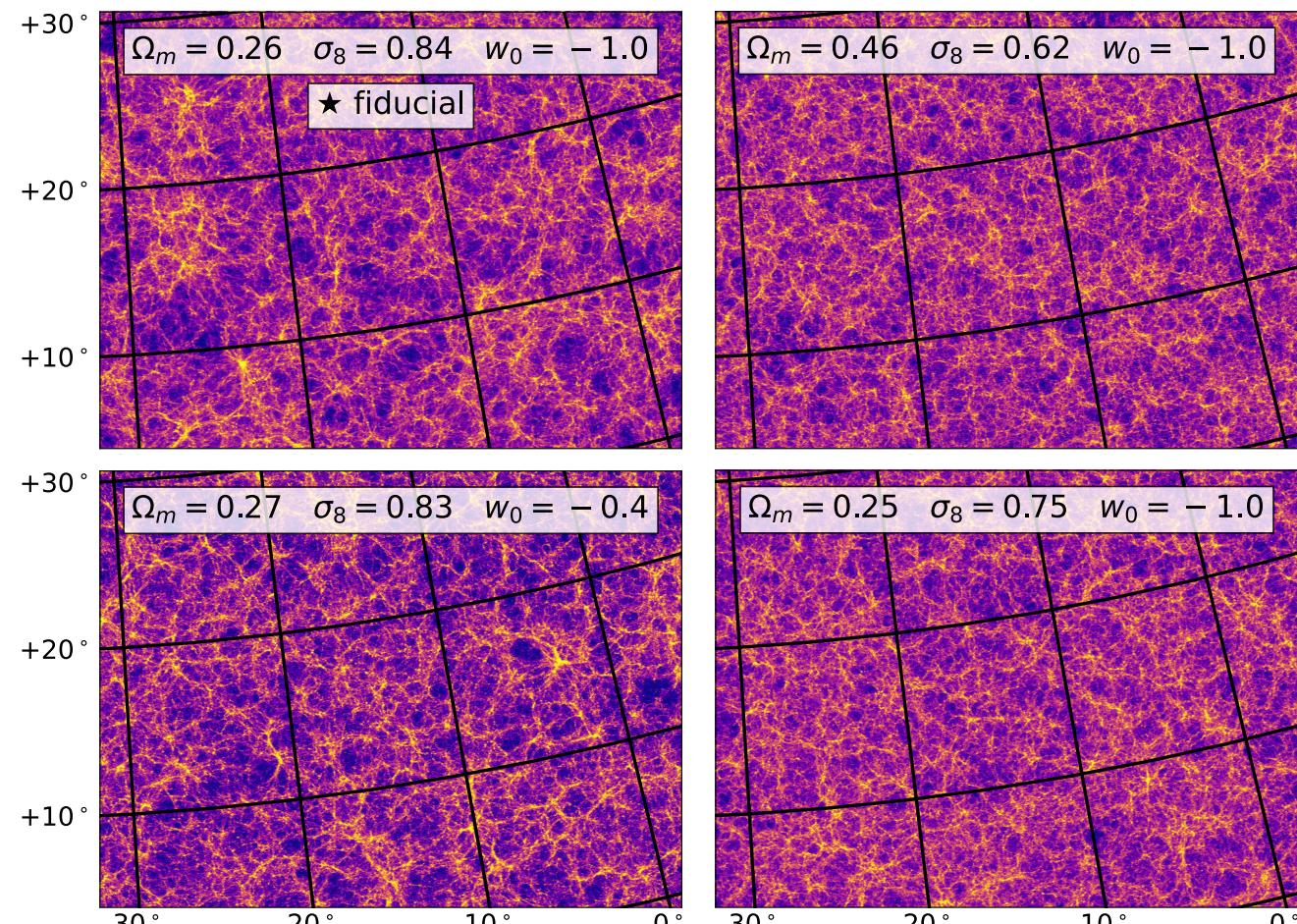


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for downstream applications: a fast simulator/emulator

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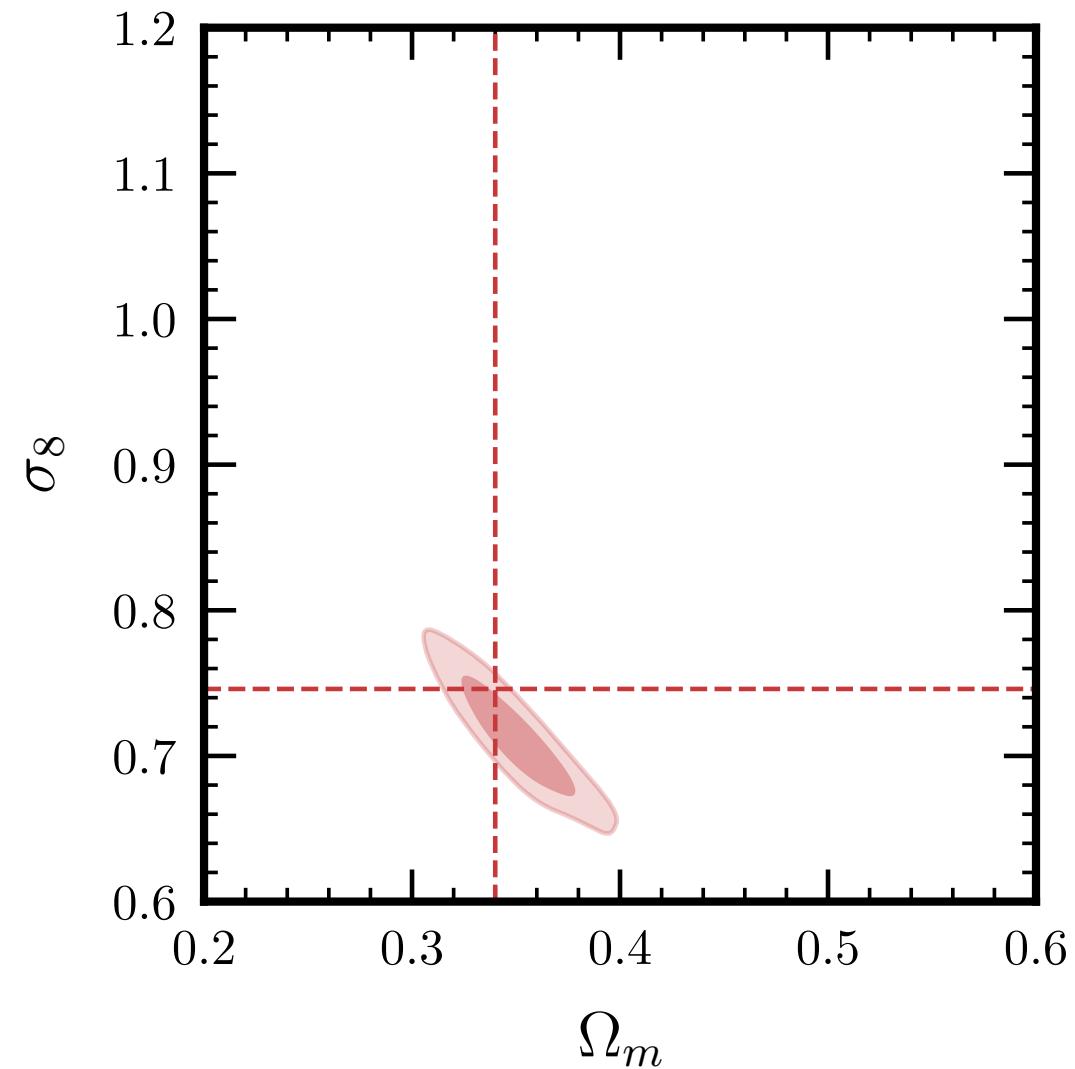


[Kacprzak et al 2022]

Evaluate likelihood

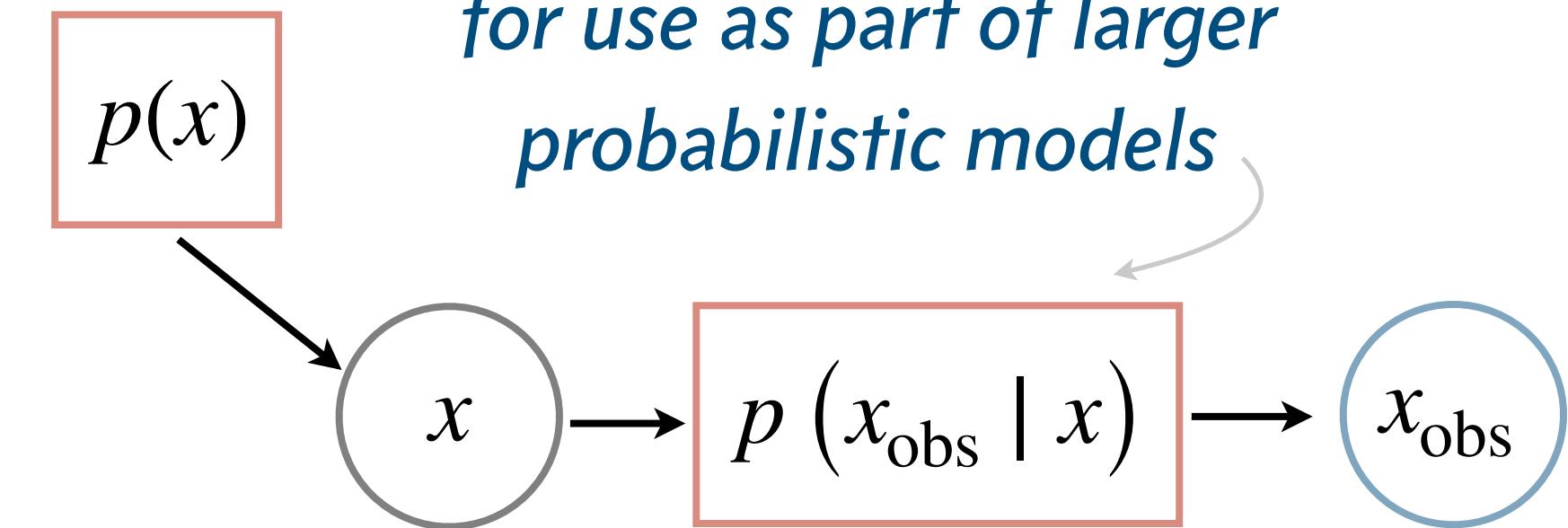
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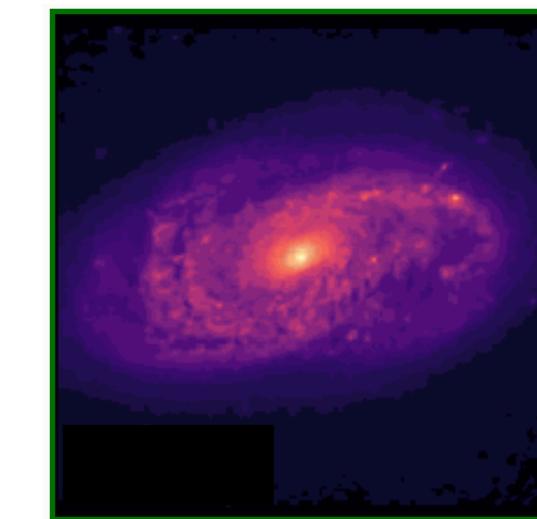


Encode complex priors

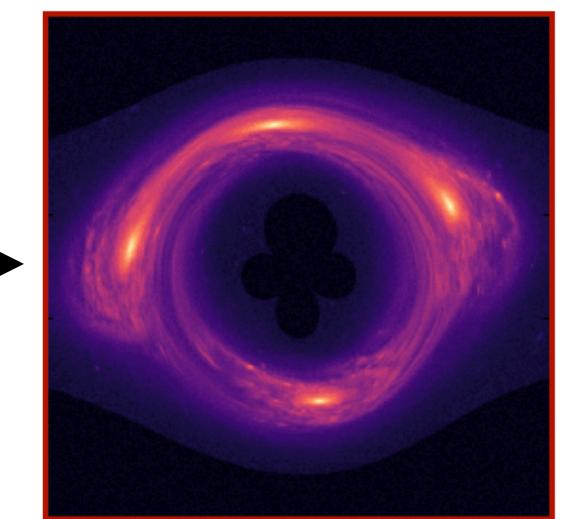
for use as part of larger probabilistic models



$p(\text{galaxies})$



Lens



Generative modeling can efficiently enable these for a wide variety of scientific data/models!

Learning the data distribution

I'm sold! *How do I learn a generative model for my data?*