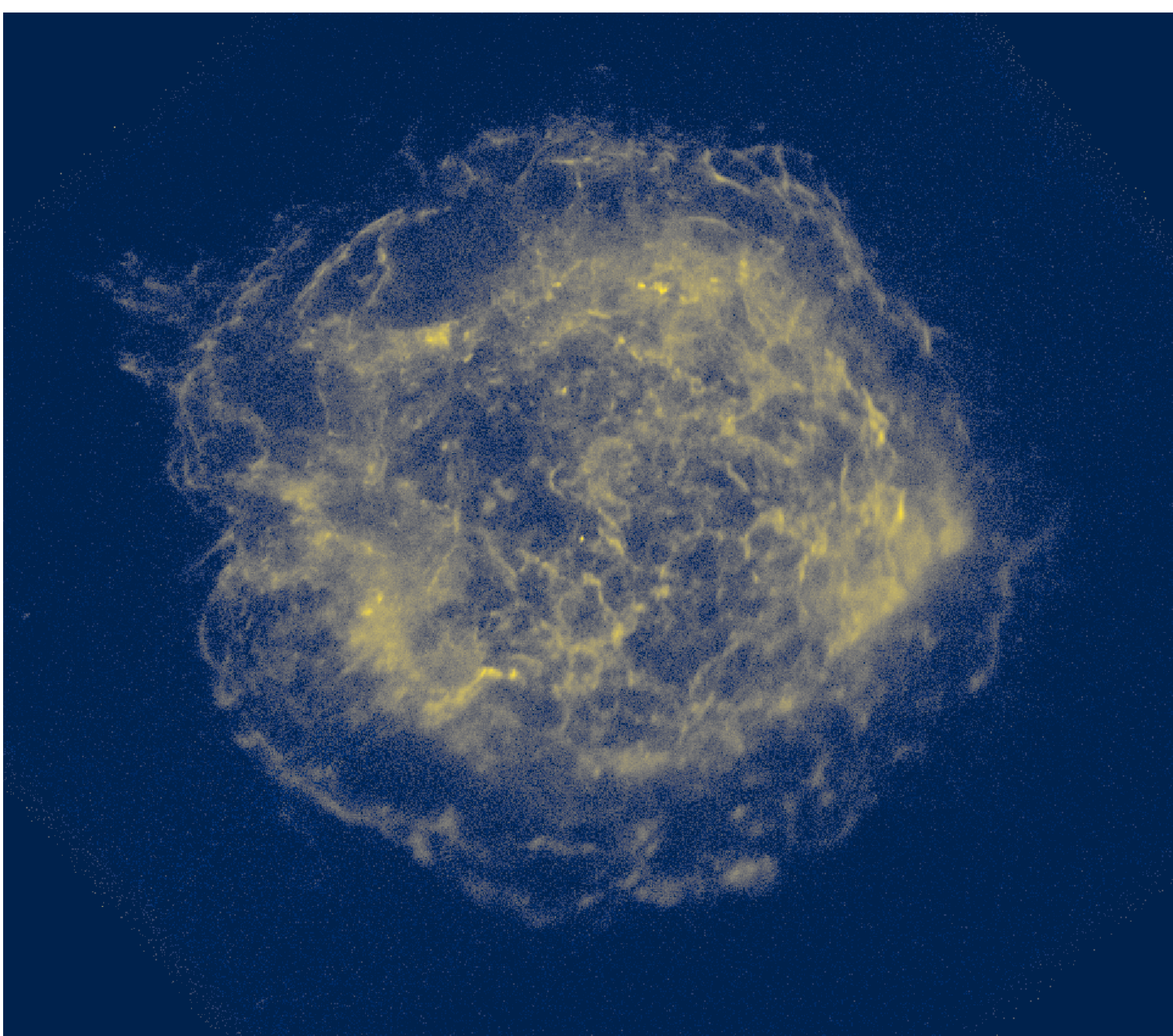


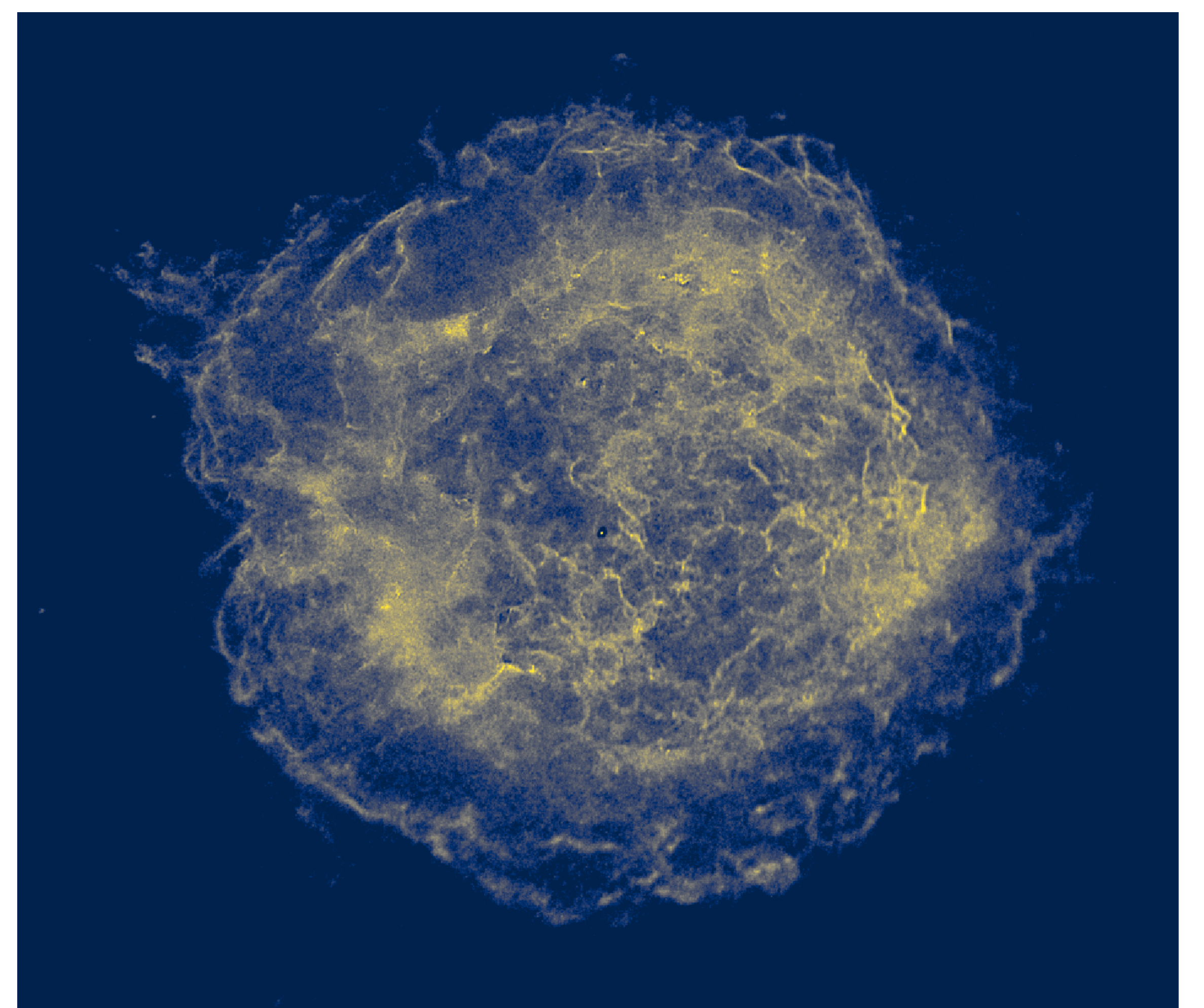
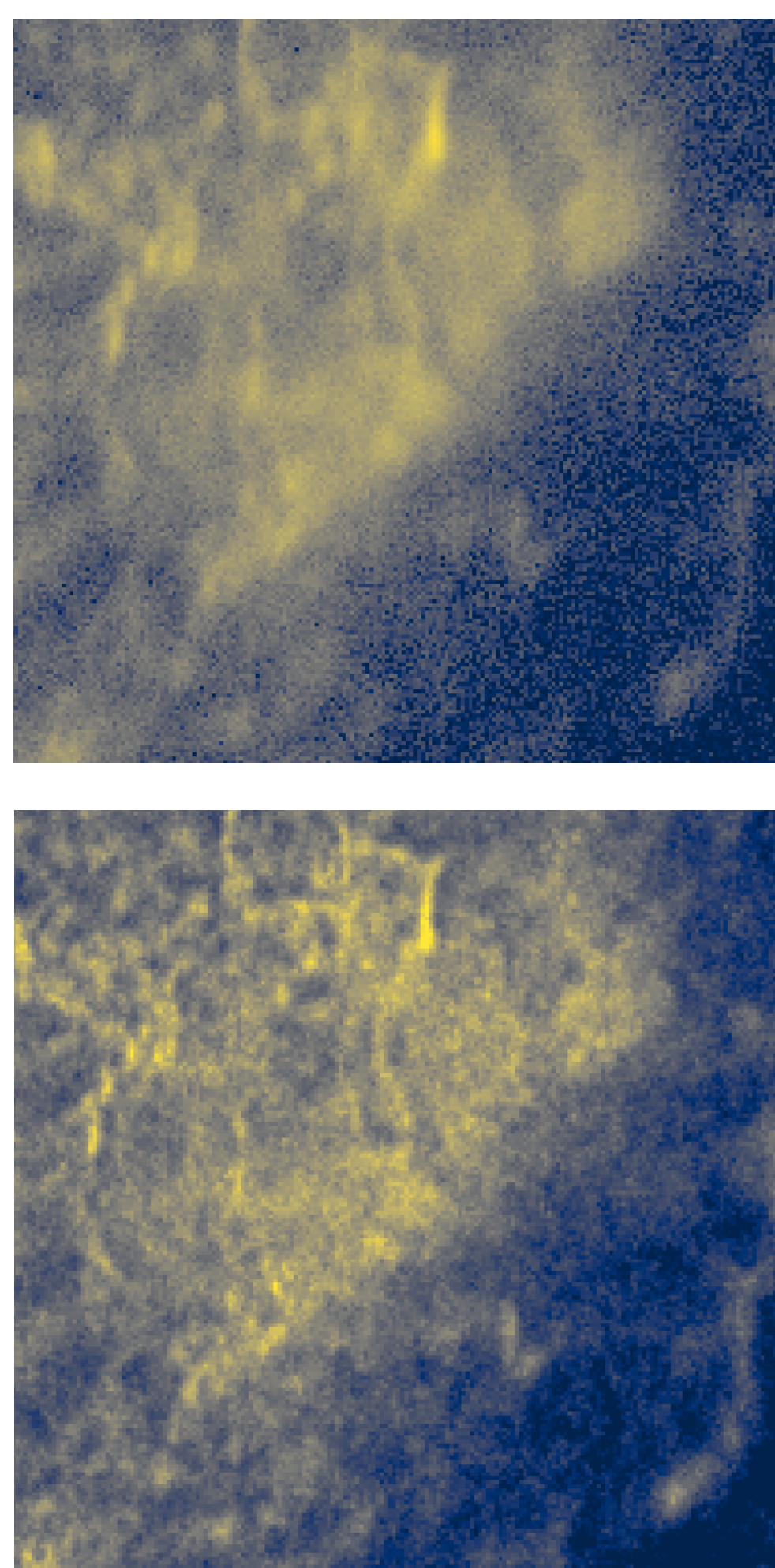
Generative models and inference algorithms can de-blur noisy observations with complex PSFs

Spatially Variant Point Spread Function Removal with Generative Modeling

Background: X-ray telescopes (e.g. eROSITA, XMM Newton, Chandra) suffer from nuisance effects, e.g. shot noise and spatially variant point spread functions. Both can be removed with Bayesian inference and generative models.

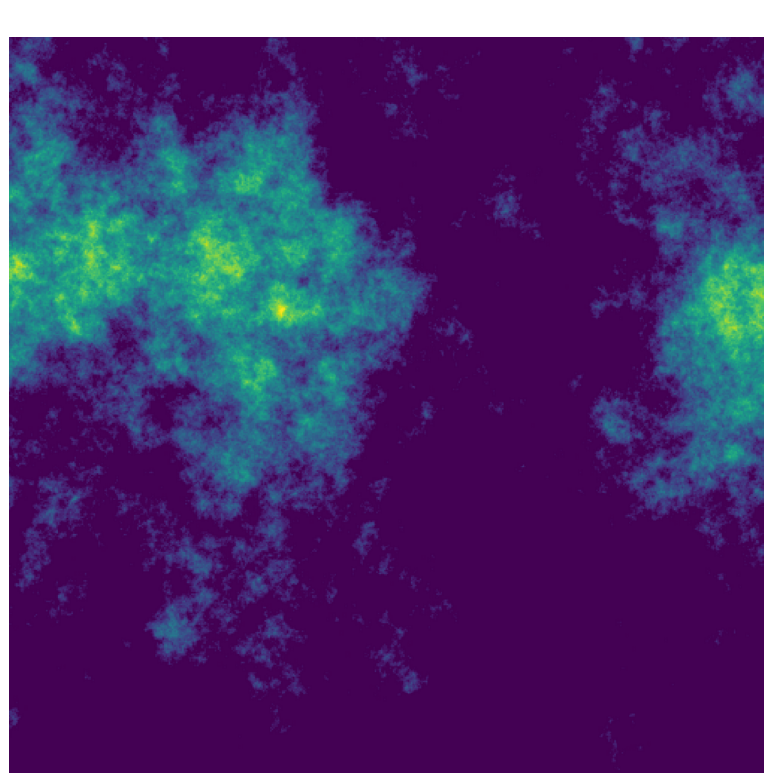


Exposure corrected data of CasA

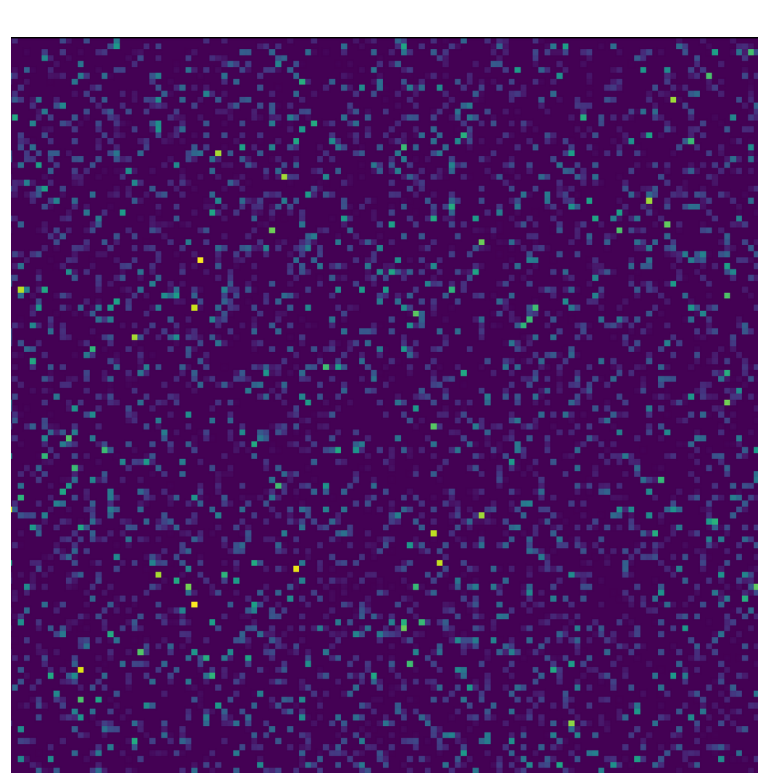


De-blurred and de-noised image of CasA

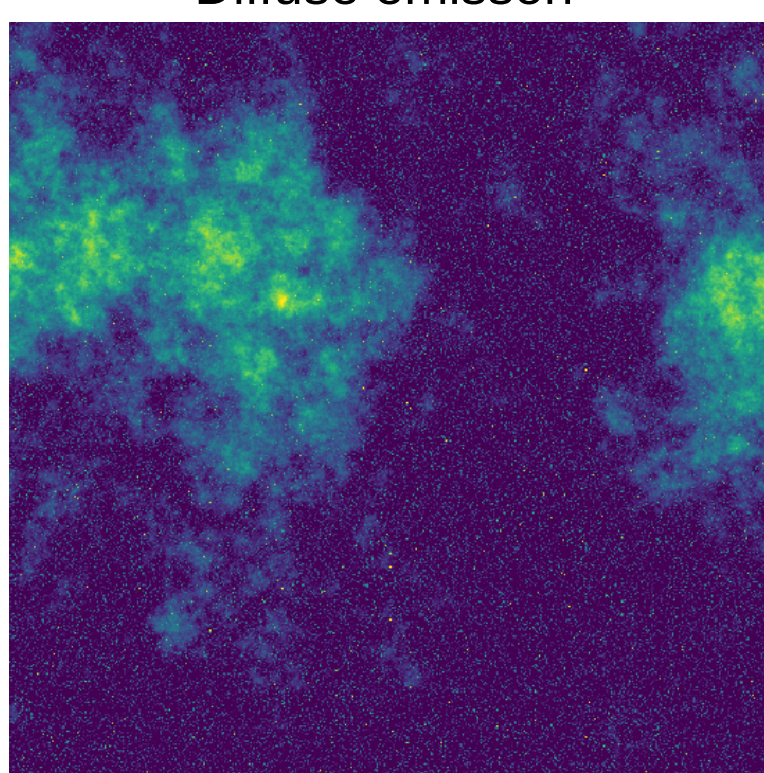
Methods



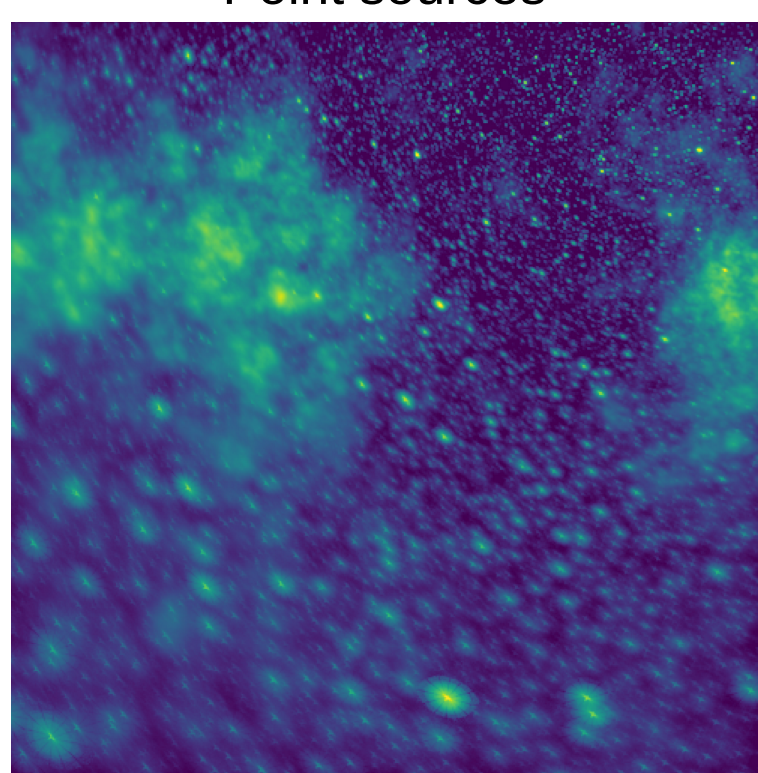
Diffuse emission



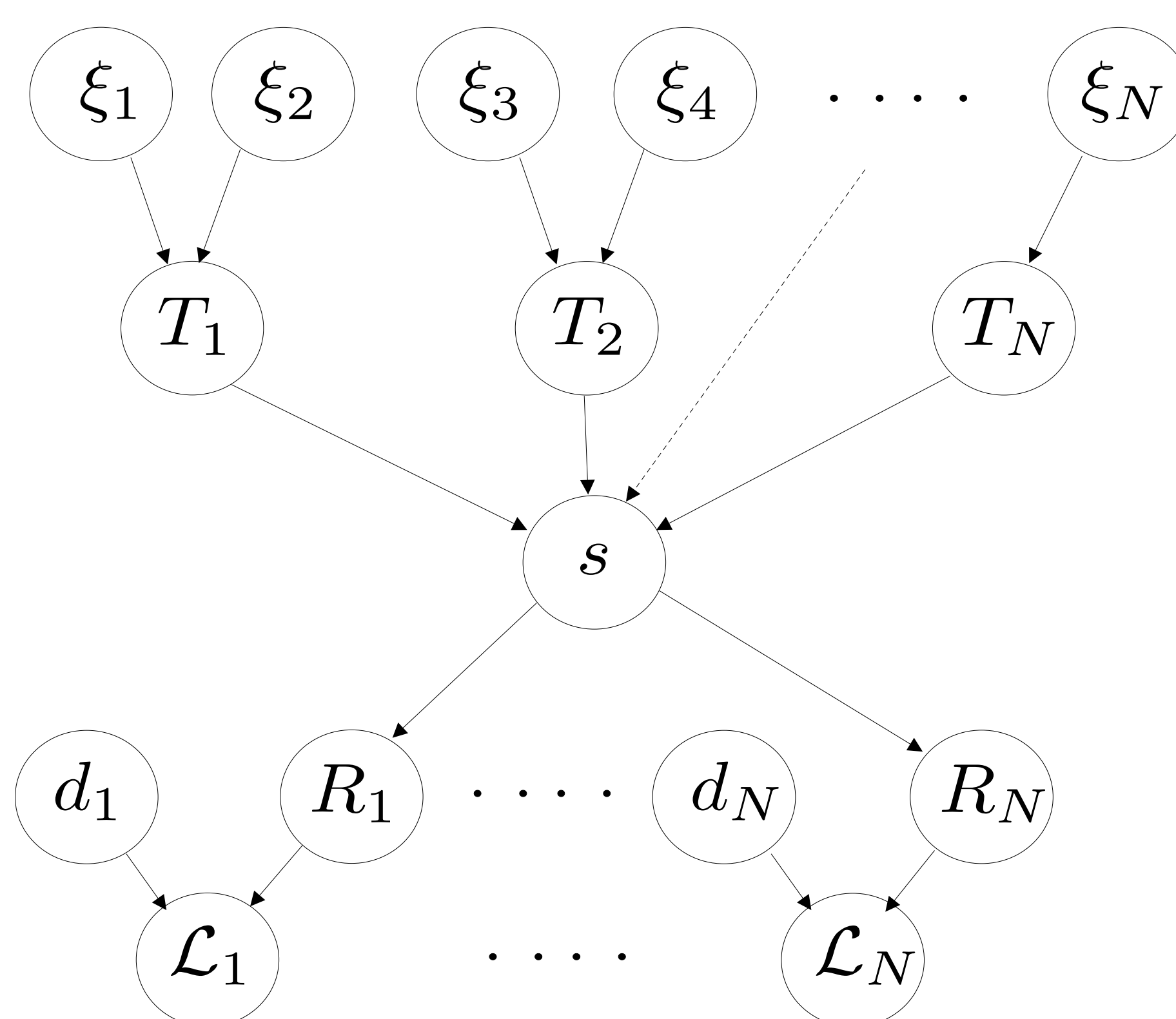
Point sources



Full sky



Blurred by instrument



$$\mathcal{P}(s)$$

Domain knowledge about the signal

$$\mathcal{P}(d|s)$$

Knowledge about the measurement

JAX-accelerated Universal Bayesian Imaging Kit is a collection of tools, modules and instrument interfaces, which allows for the application of Numerical Information Field Theory (NIFTy) to astronomical X-ray data.



SLIDES



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