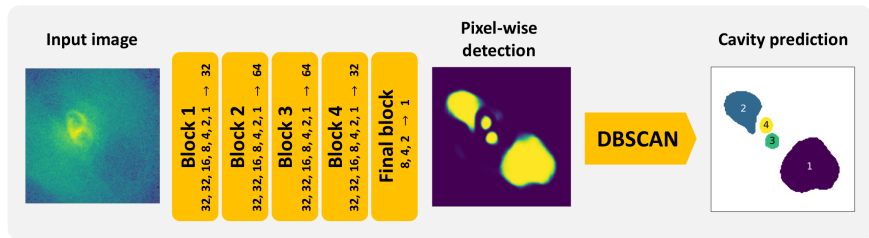


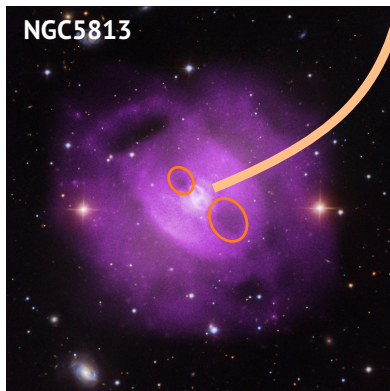
Cavity Detection Tool (CADET)



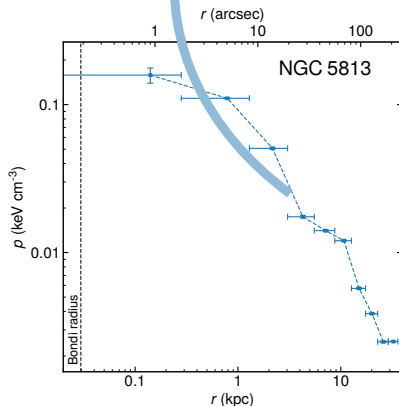
X-ray cavities



$$\text{Energy} \propto \text{Volume} \times \text{pressure}$$



Credit: Randall et al. 2015

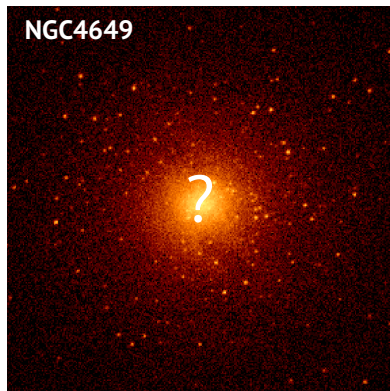


Credit: Plšek et al. 2022

X-ray cavities

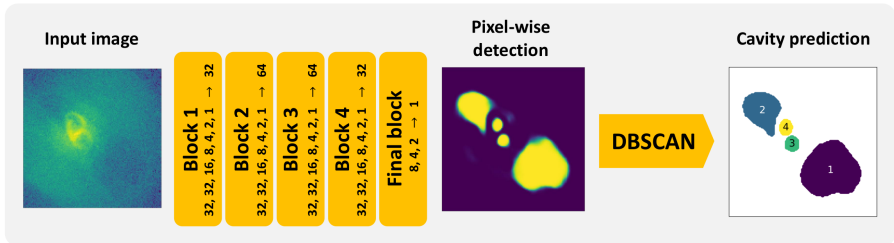


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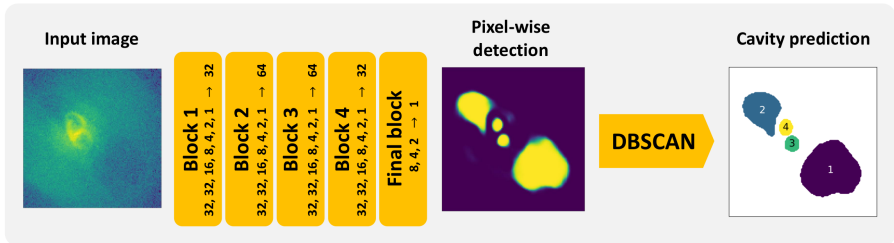
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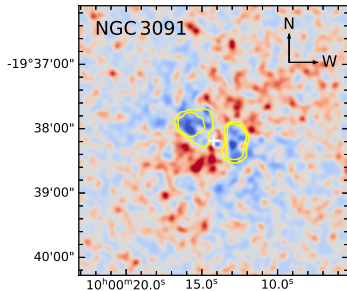


- convolutional neural network
+ DBSCAN clustering

Cavity Detection Tool (CADET)



- convolutional neural network + DBSCAN clustering
- 93 of 97 known X-ray cavities - abs. volume error 23_{-11}^{+18} %
- 7 new X-ray cavities (+ 8 candidates)



How to use CADET?



- raw Keras model

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from tensorflow.keras.models import load_model  
  
model = load_model("CADET.hdf5")  
  
y_pred = model.predict(X)
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- DS9 plugin (installed with pycadet)