

Neural Networks and GREAT10 Galaxies

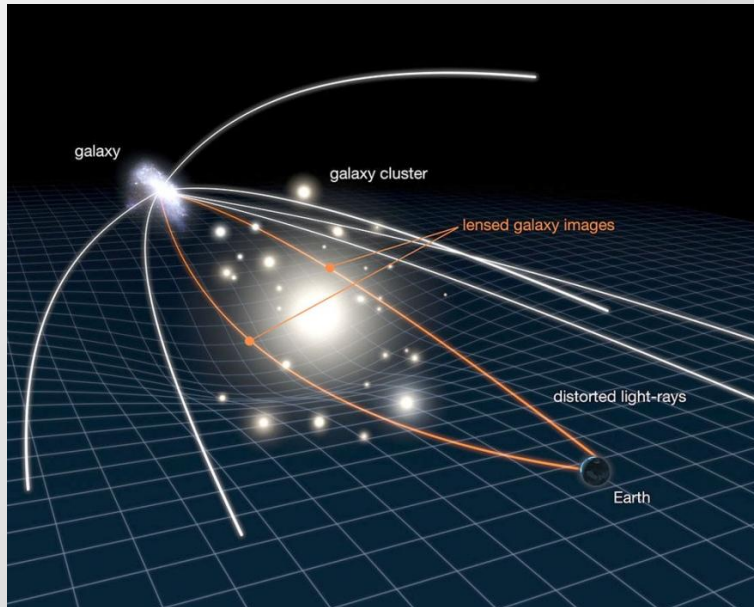
Adam Gauci - Department of Intelligent Computer Systems,
Faculty of ICT, University of Malta, Malta.

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Faculty of ICT, University of Malta, Malta.

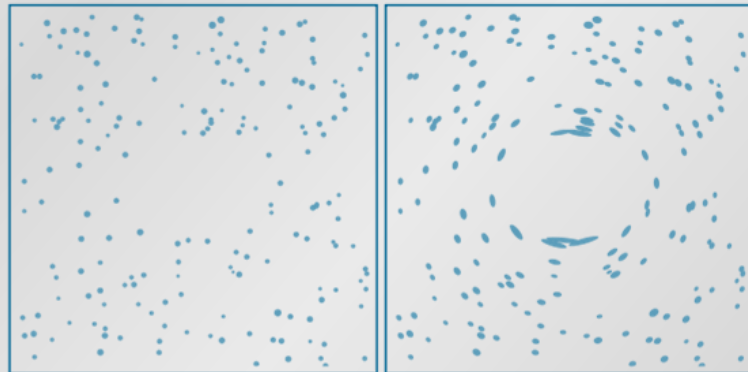
Kristian Zarb Adami - Department of Physics,
Faculty of Science, University of Malta, Malta.

Lance Miller - Department of Physics,
University of Oxford, UK.



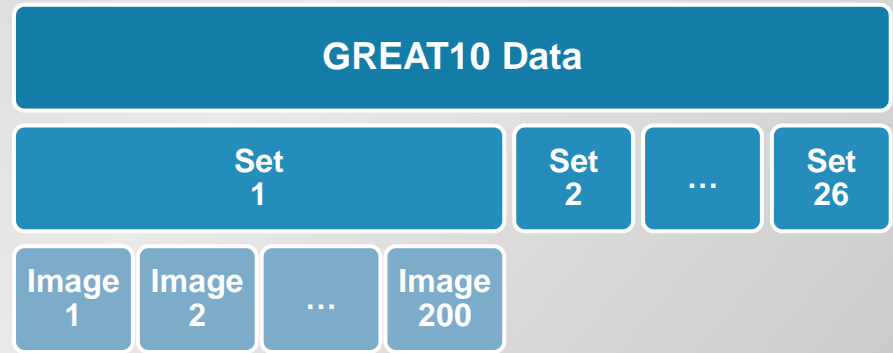


Gravitational Lensing (Credit: NASA, ESA & L. Calçada)

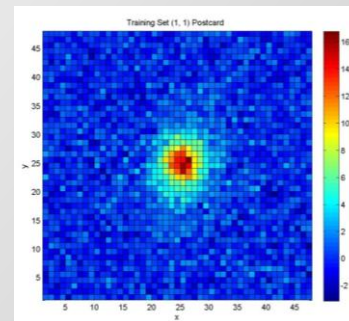


Unlensed

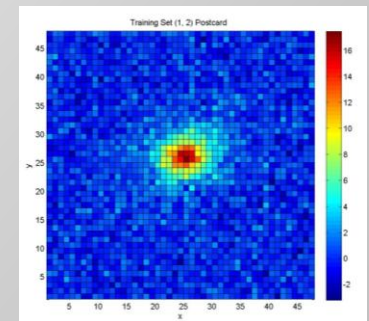
Lensed



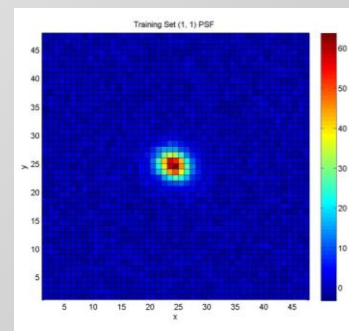
GREAT10 Galaxy Data Structure



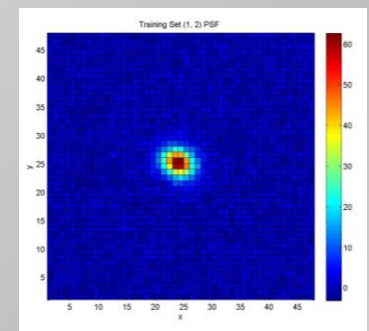
Postcard 1



Postcard 2

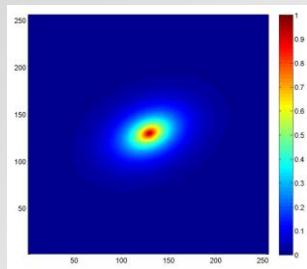
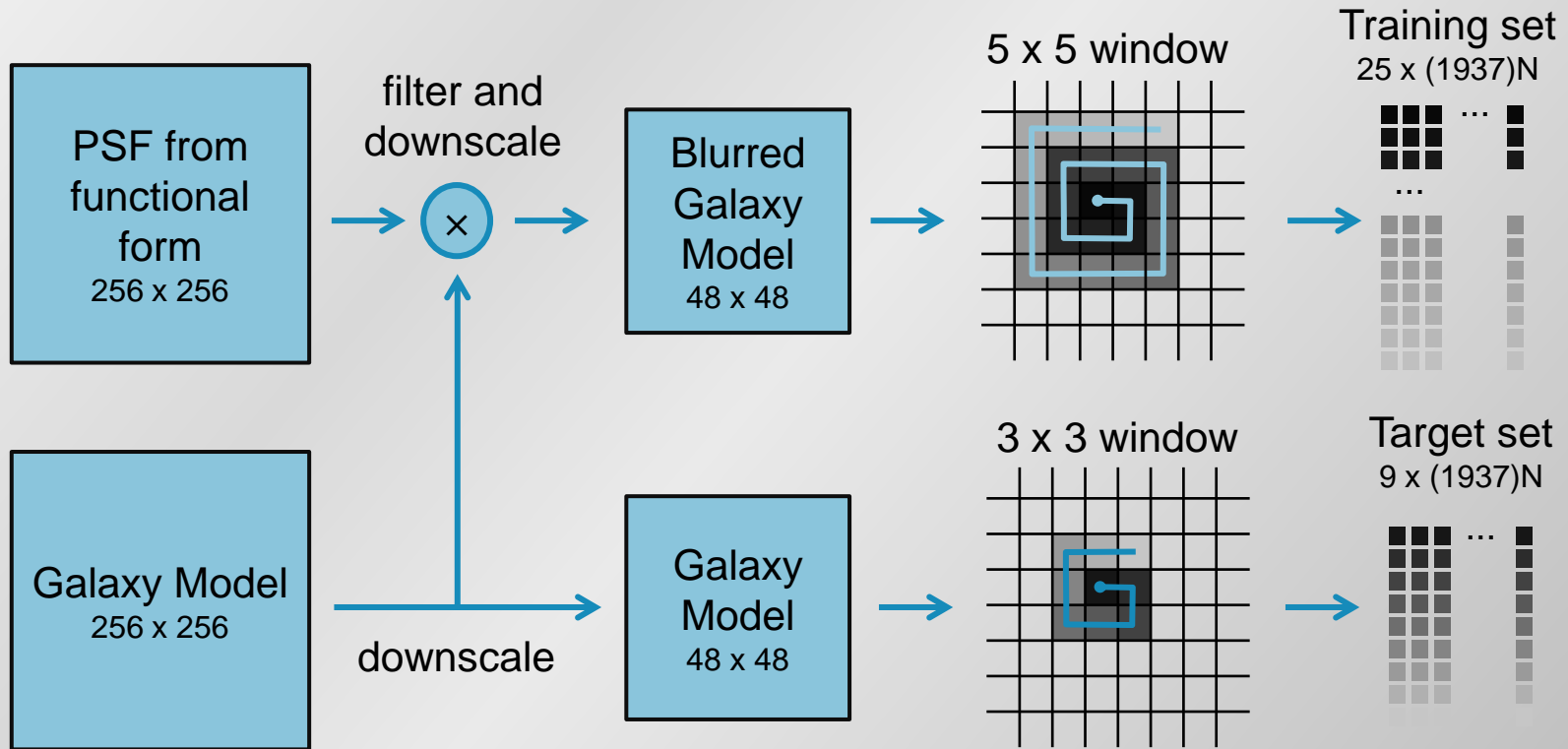


PSF 1

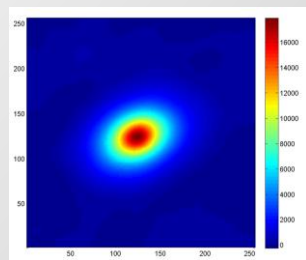


PSF 2

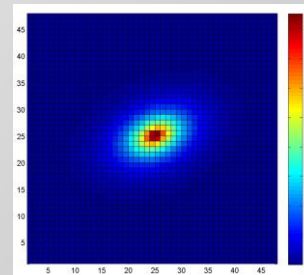
Artificial Neural Networks



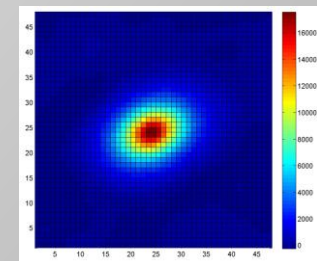
Galaxy Model High Res (256 x 256)



Blurred Galaxy Model High Res (256 x 256)

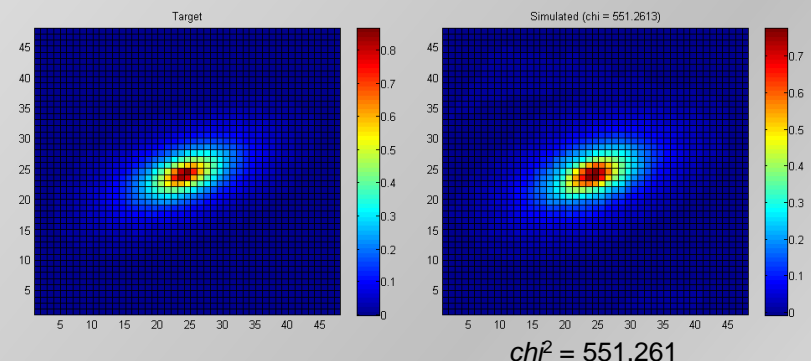
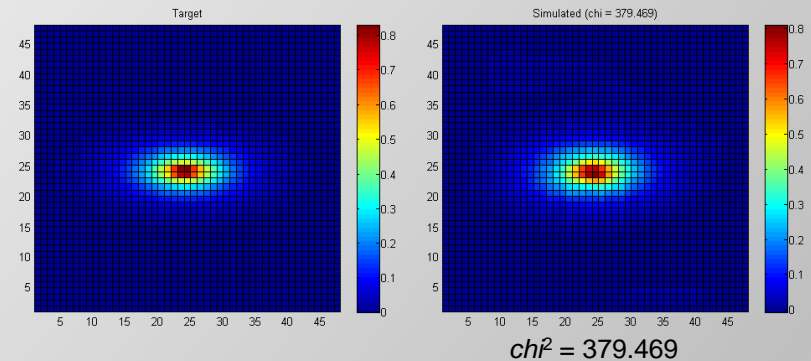
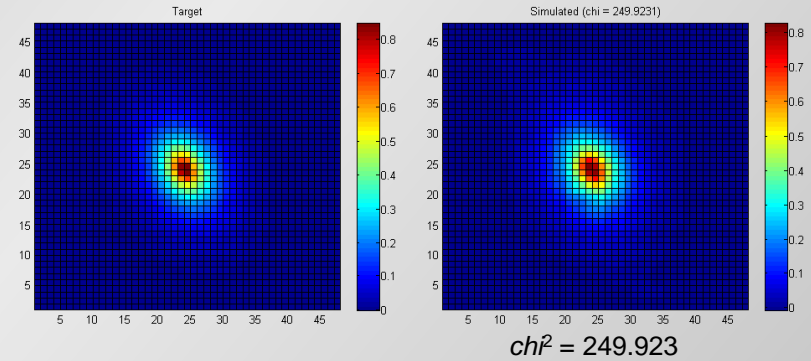
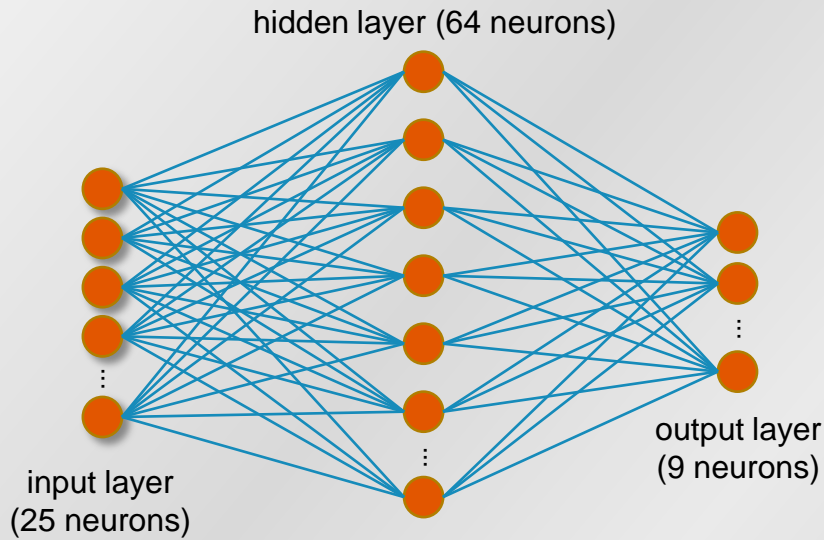


Galaxy Model Downsampled (48 x 48)



Blurred Galaxy Model Downsampled (48 x 48)

Prototype results



Training	87165 x 25
Testing	9685 x 25
Structure	25 : 64 : 9
MSE	9.5366×10^{-5}
Training R	0.992960
Average Chi²	393.551

