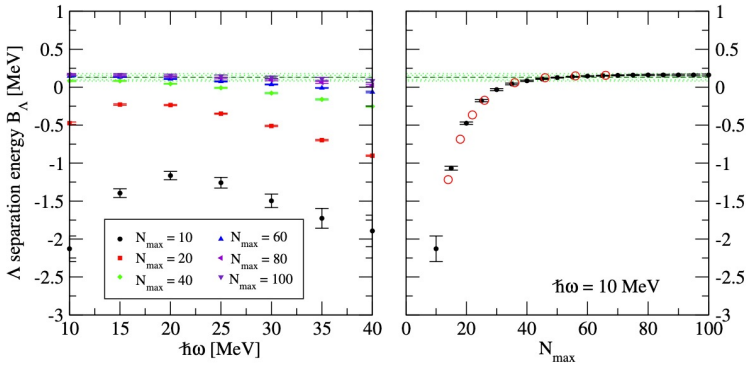
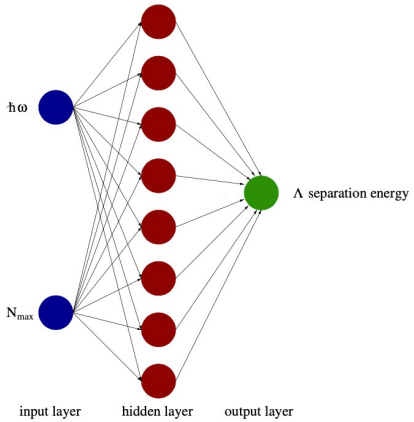
Machine Learning light hypernuclei

- We employ a feed-forward ANN to extrapolate at large model spaces the results of *ab-initio* hypernuclear NCSM calculations for the Λ separation energy B_Λ of the lightest hypernuclei, obtained in accessible HO basis spaces using chiral NN, NNN & YN interactions

- The overfitting problem is avoided by enlarging the size of the input dataset & by introducing a Gaussian noise during the training process of the neural network

- We find that a network with a single hidden layer of eight neurons is enough to extrapolate correctly the value of B_Λ to model spaces of size N_{max}=100





Hypernucleus	ANN Prediction	Experimental Vaue
${}^{3}_{\Lambda}H$	0.16 ± 0.01	0.13 ± 0.05
${}^{4}_{\Lambda}H(0^+)$	2.47 ± 0.03	2.157 ± 0.077
${}^{4}_{\Lambda}H(1)$	1.37 ± 0.03	1.067 ± 0.08
${}^{4}_{\Lambda}He(0^+)$	2.41 ± 0.04	2.39 ± 0.05
${}^{4}_{\Lambda}He(1^+)$	1.33 ± 0.03	0.984 ± 0.05