## AWGN : Additive White Gaussian Channel

channel output $Y = X + n$

where $X$ is channel input and $n$ is an additive band-limited white gaussian noise. with zero mean and variance $\sigma^2$.

Capacity of AWGN channel.

$$C_s = \frac{1}{2}\log_2\left(1 + \frac{S}{N}\right) \quad \text{b/sample}$$

$$\boxed{C = B\log_2(1 + S/N) \quad \text{bits/sec}}$$ Shannon – Hartley law.

where $S$ : average signal power

$N$ : average Noise power $(N = \eta B)$

$B$ : Bandwidth of channel.