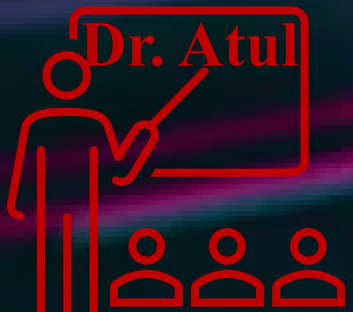


# Basics of Signal Representation and Analysis



gmp

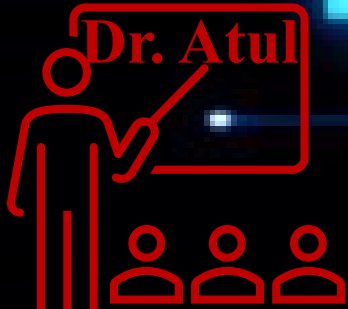
\* \* \* \* \*

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# Signal

# Representation

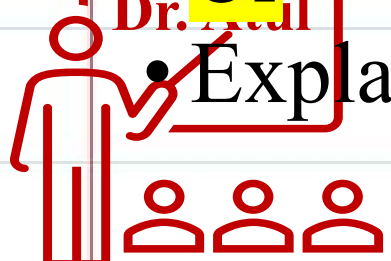


# Important Questions

Dr. Atul

- What do you mean by a Signal Representation
- Or
- Write short note on (i) Graphical representation (b) Mathematical representation (c) Tabular Representation
- Or
- What is the difference between time domain and frequency domain representation of signals
- Or
- What is the difference between discrete and digital signals
- Or
- Explain classification of signals

Dr. Atul

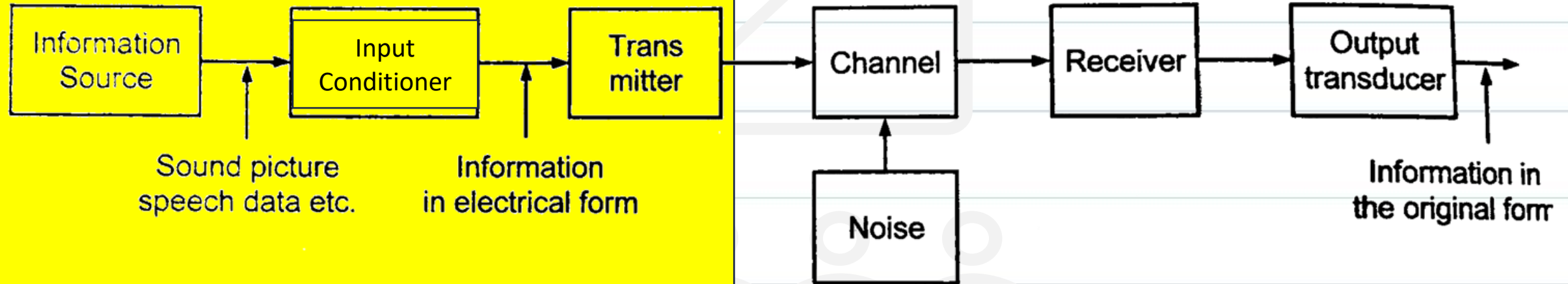


# Communication System

- Communication is transfer of information from place to other place.
- The devices used for communication are called equipments of communication and assembly of these devices is called communication system.
- The information to be transferred can be in the form of sound, temperature, text, image, video etc. It need to be converted into electrical form before transmission.
- Representation of information in terms of amplitude of voltages and currents is called **Signal**



# Signals in Communication Systems



# Signals

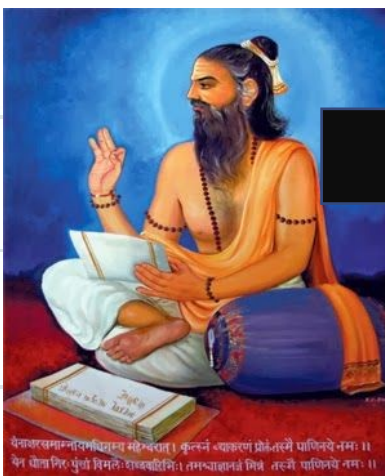
- Signals are representation of information.
- Signals are used to transfer information from one place to other using communication systems
- Examples of signals are ECG, Temperature, pressure etc
- Signals are analysed in time domain and frequency domain
- Signals are converted to frequency domain from time domain with the help of Fourier Transform , Laplace Transform, Z transform etc





# The Story

Reference : Boyer, C.B. (1991) [1989], A History of Mathematics (2nd ed.), New York: Wiley, ISBN 978-0-471-54397-8



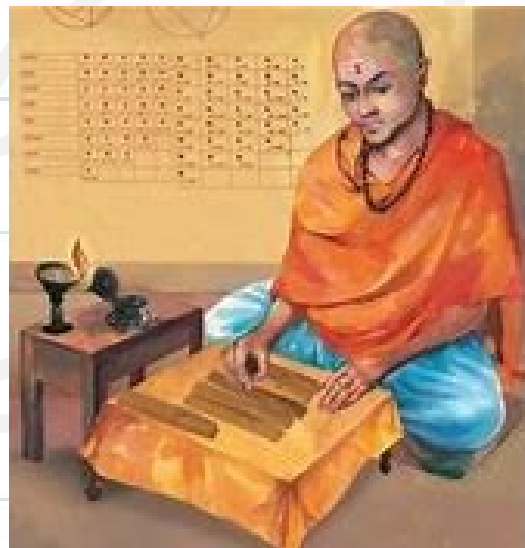
Panini(5<sup>th</sup> centry BC)

Modern Mathematical notations, recursion, transformation



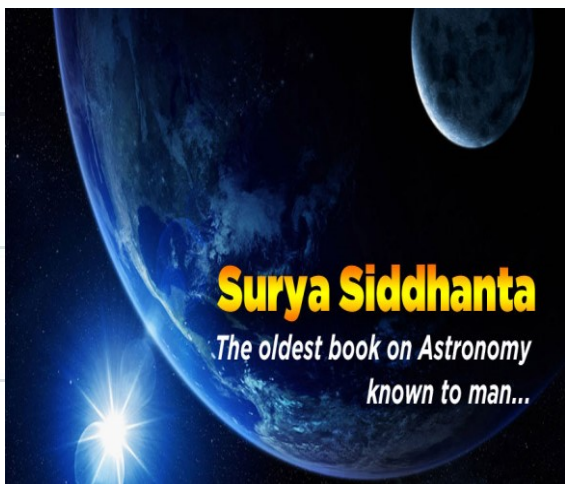
Aryabhata(476–550 AD)

Sulb Sutras, Sin, cosine,

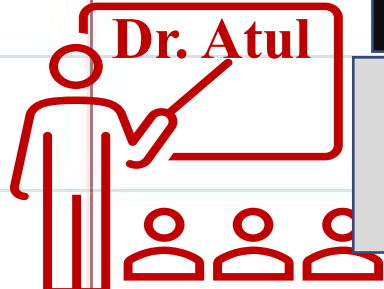


Varahmihir(505–587 CE)

Extended the work of Aryabhata in Astronomical Science



Written by : **LataDev** : Disciple of Aryabhata

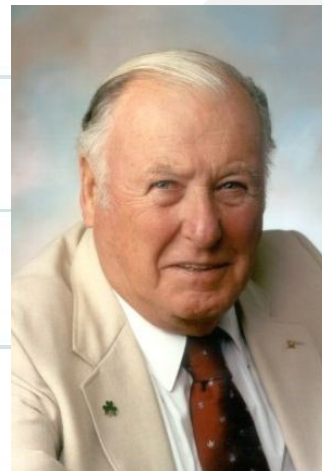


# The Story [Part-02]

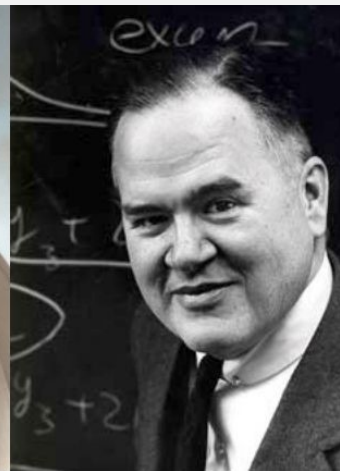


**Josef Fourier (1768–1830)**

- Heat Propagation Equation
- Fourier Series
- Fourier Transform



James William Cooley  
(1926-)



John Wilder Tukey  
(1915-2000)

## Collaborative work

- Fast Fourier Transform
- Modern Signal Processing



**Pierre-Simon, marquis de Laplace (1749–1827)**

- Bayesian Interpolation
- Laplace Equation
- Laplace Transform
- Laplacian Differential operator
- Stability of solar system



**Witold Hurewicz (1904–1956)**

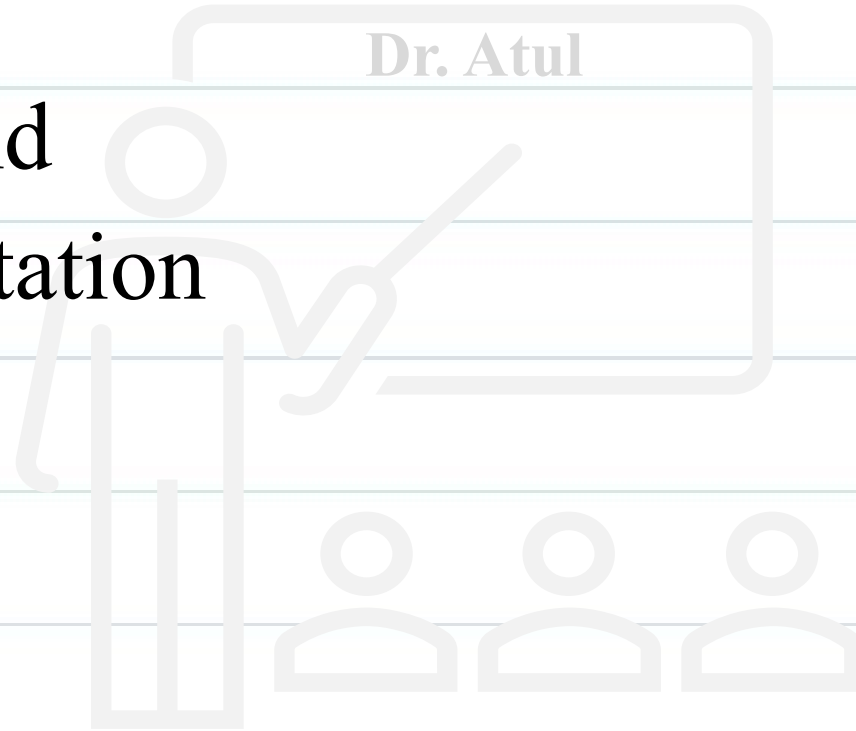
-Z Transform





# Representation of Signals

- Graphical,
- mathematical and
- tabular representation



# Classification of signals

- Continuous and discrete signals
- Digital and Analog signals
- Even and odd signals
- Periodic and Aperiodic Signals



# Thanks for watching

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