

## Solar Energy and earth sun geometry

### Solar Energy

- Fusion
  - Principal outputs
    - Solar wind
    - EMR

### EMR

- Radiant energy travels at speed of light to earth
  
- All objects emit EMR at wl related to T

### Insolation

- Intercepted EMR

### Uneven distribution

- Tropics have more concentrated insolation
  
- Subsolar point
  - Declination

### Seasons

- Seasonality
  - tilt
  - Effects
  
- Revolution

- Elliptical
  - Aphelion
  - Perihelion
  
- Rotation
  
- Tilt
  
- Solstice
  - Declination
  
  
- Equinox  
Declination
  
  
- Solar elevation
  
  
- Zenith angle
  - 
  - Ex.
  - Declination is 23.5 degrees south
  - Given latitude is 50 degrees South

Calculate solar elevation

- Same hemisphere
  - Given latitude is  $30^{\circ}$  N
  - Summer solstice

Using analemma to calculate earth sun geometry

- May 15

- Oct 10

- Daylength

- 0 degrees

- Summer

- Winter