

# Elementos do céu

**R. Boczko**

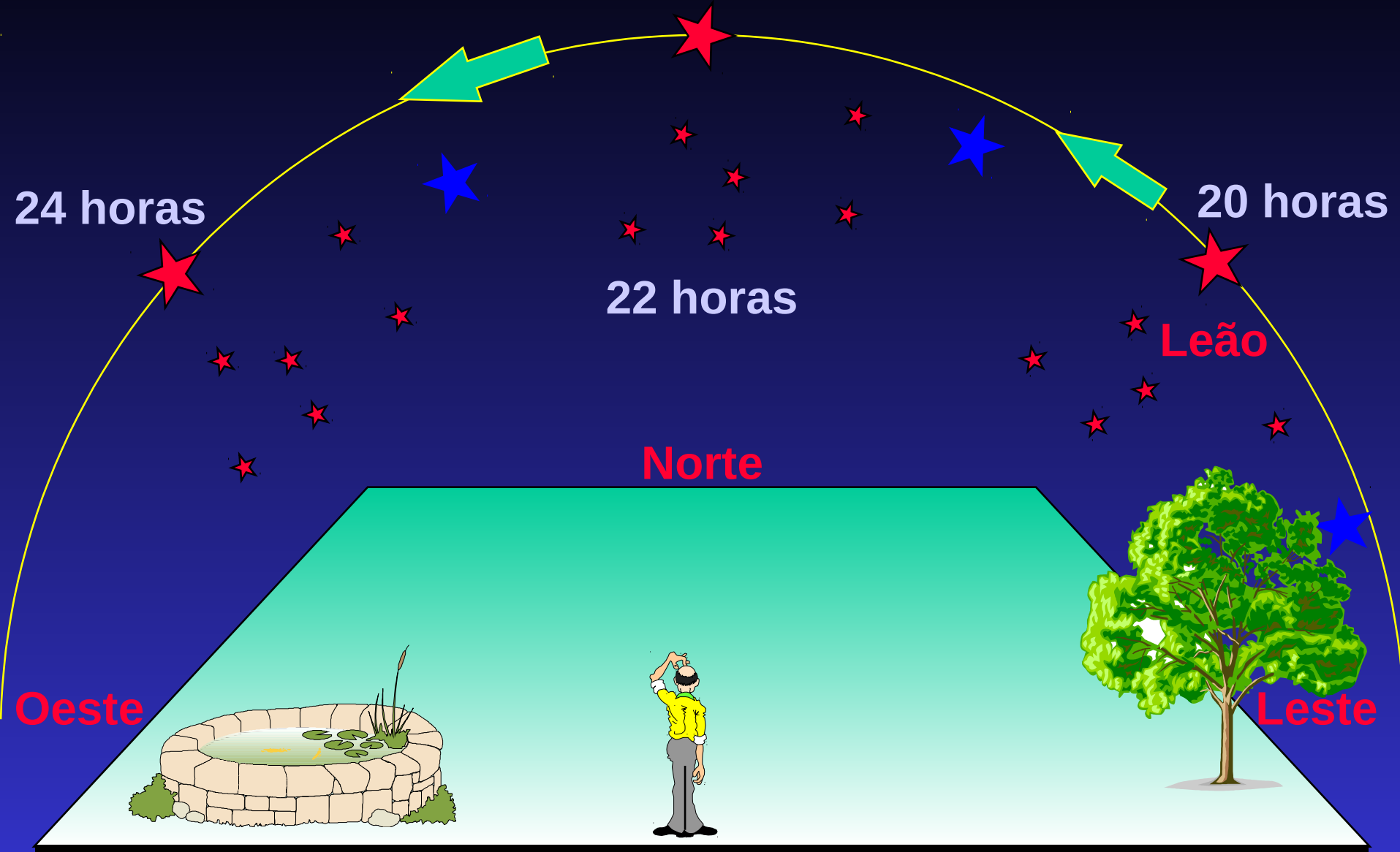
IAG - USP

# **Pólos celestes sul e norte**

# Movimento noturno aparente olhando ao Sul

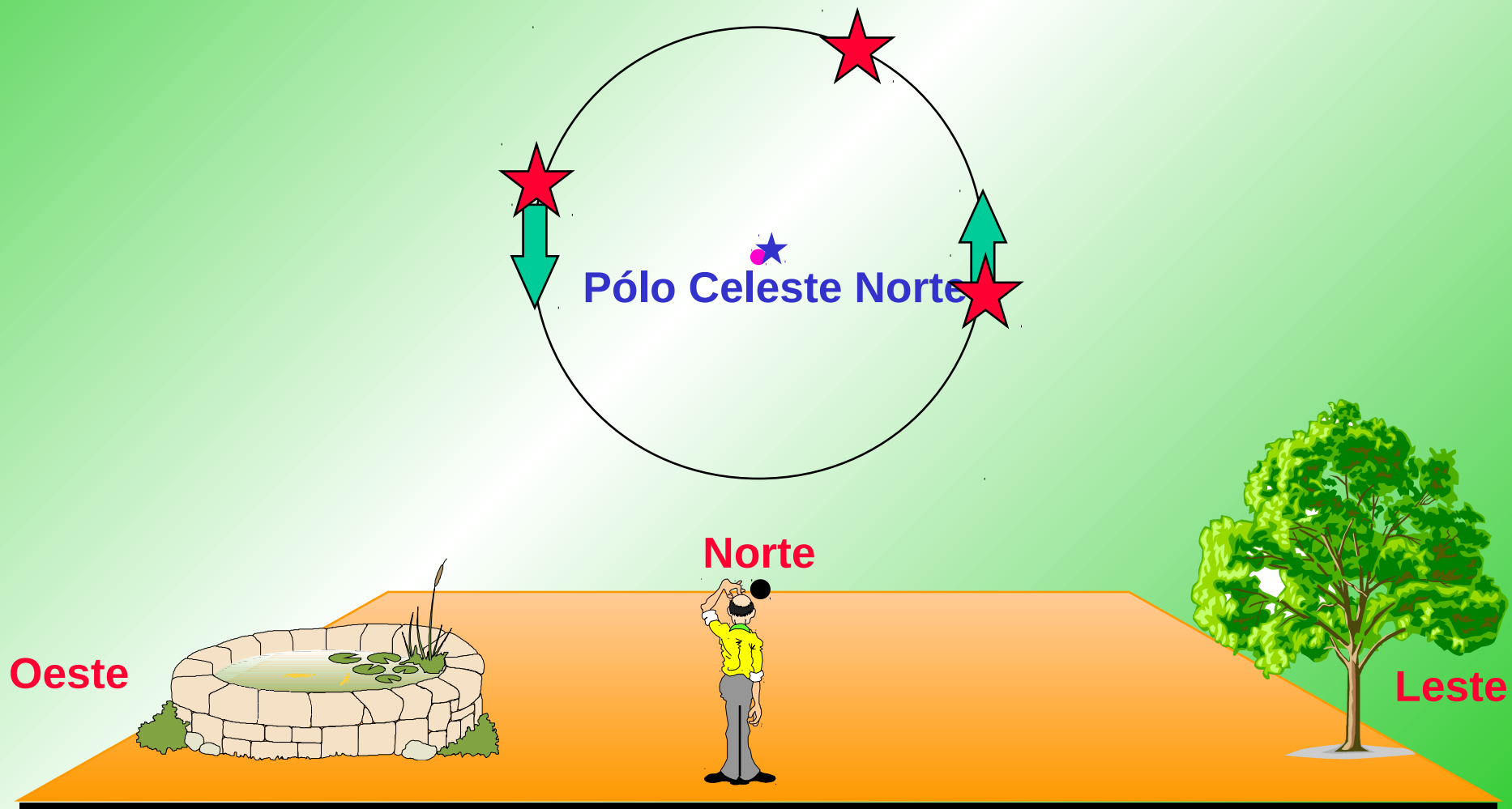


# Movimento noturno aparente olhando ao Norte, observador no Hemisferio Sul

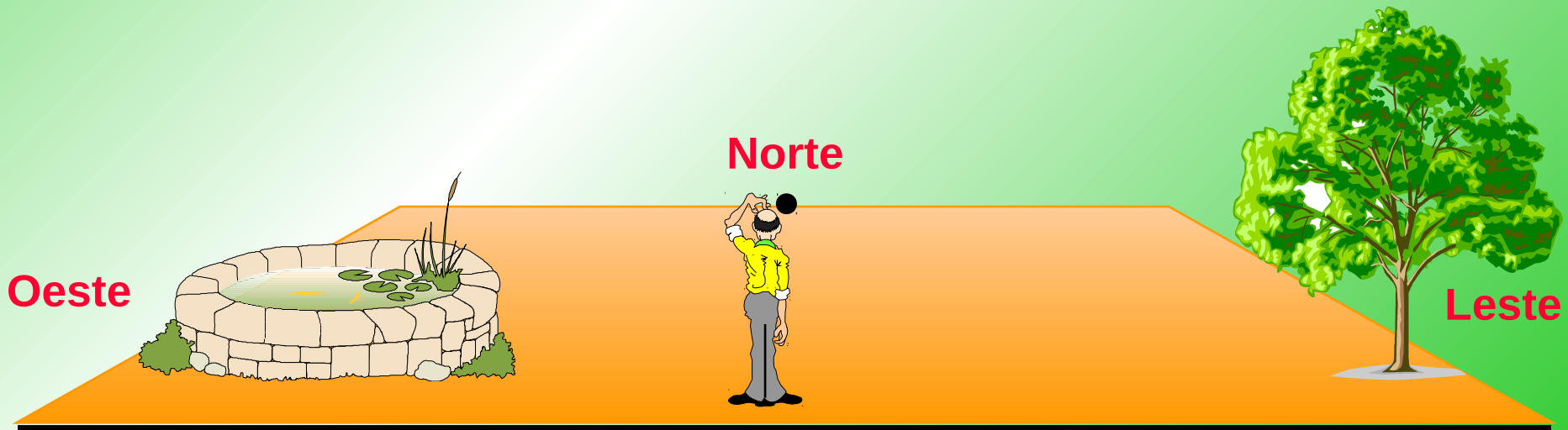
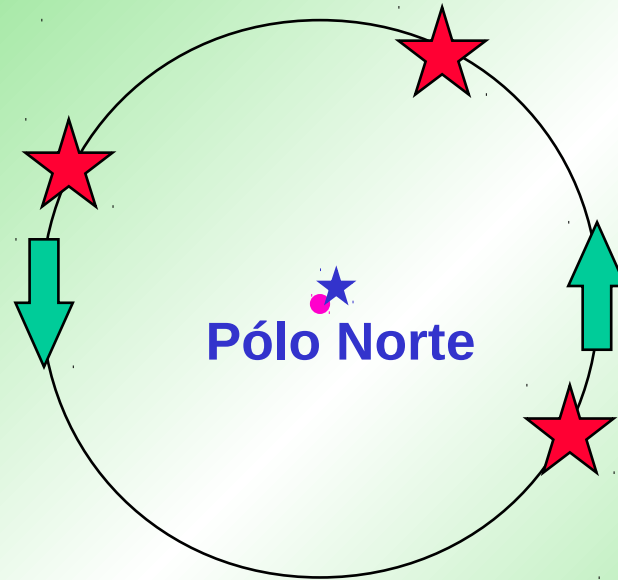


# Estrelas circumpolares

Estão sempre acima do horizonte quando vistas por um observador a uma determinada latitude.

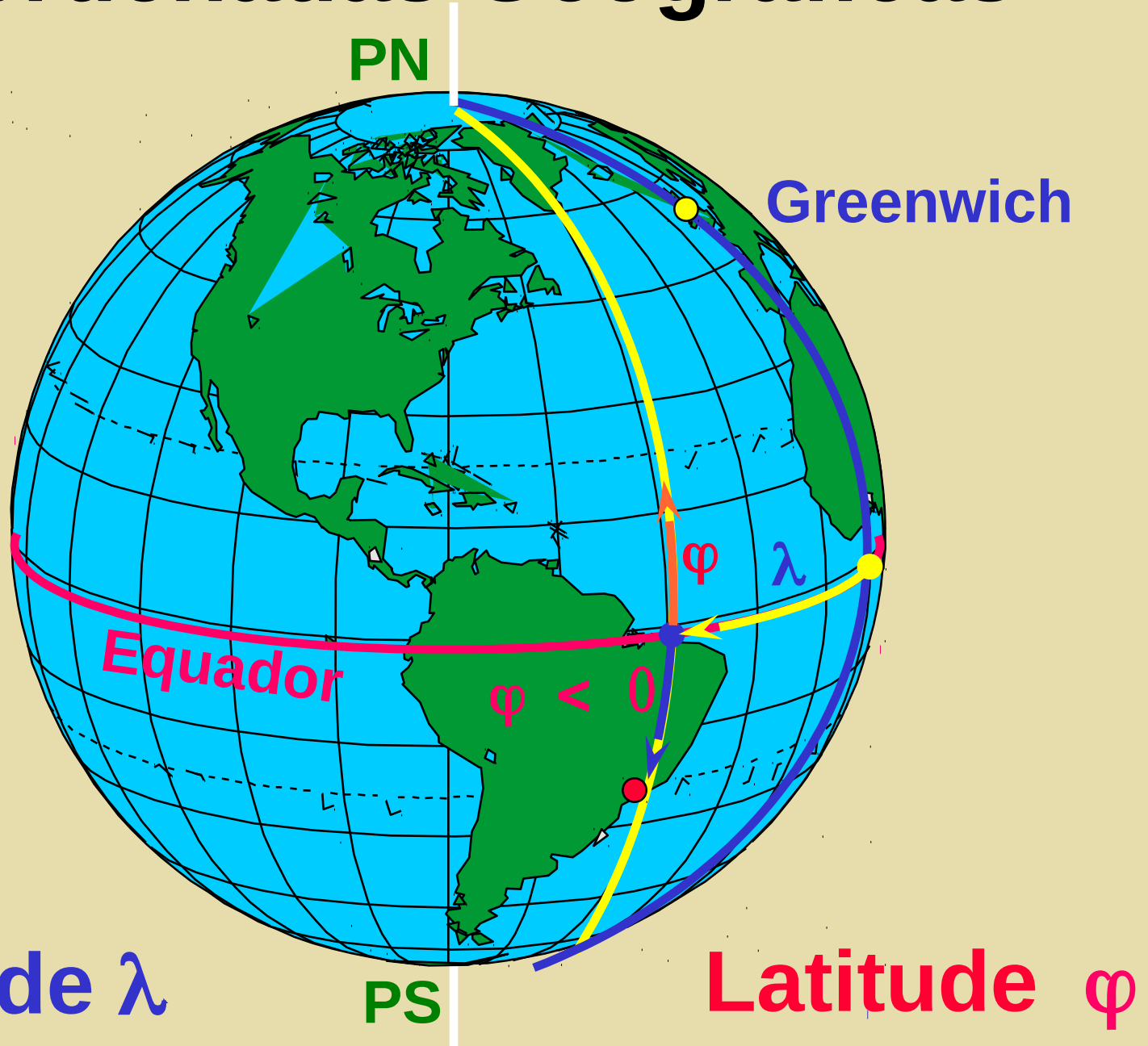


# Movimento aparente de uma estrela circumpolar norte



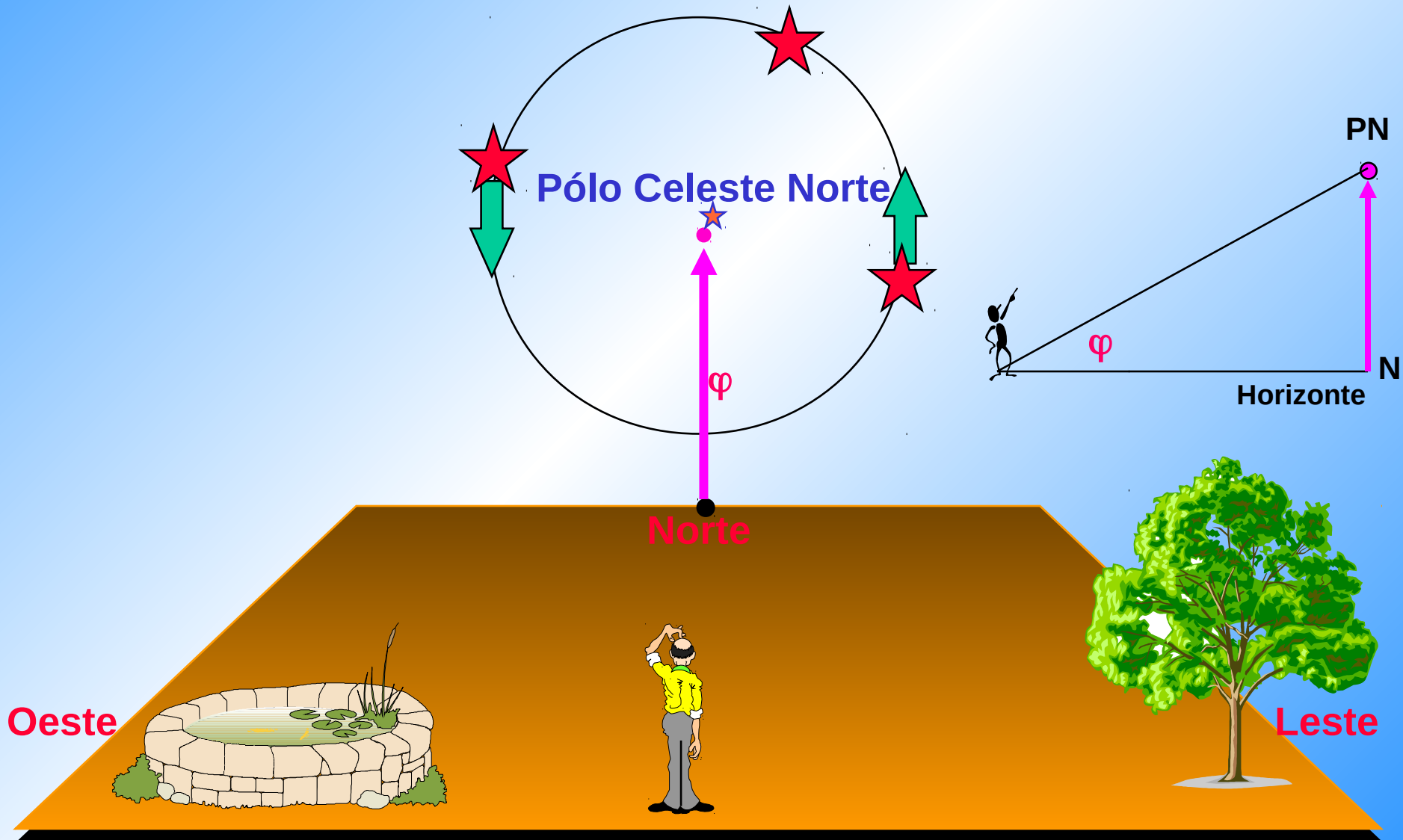
# **Latitude astronômica**

# Coordenadas Geográficas

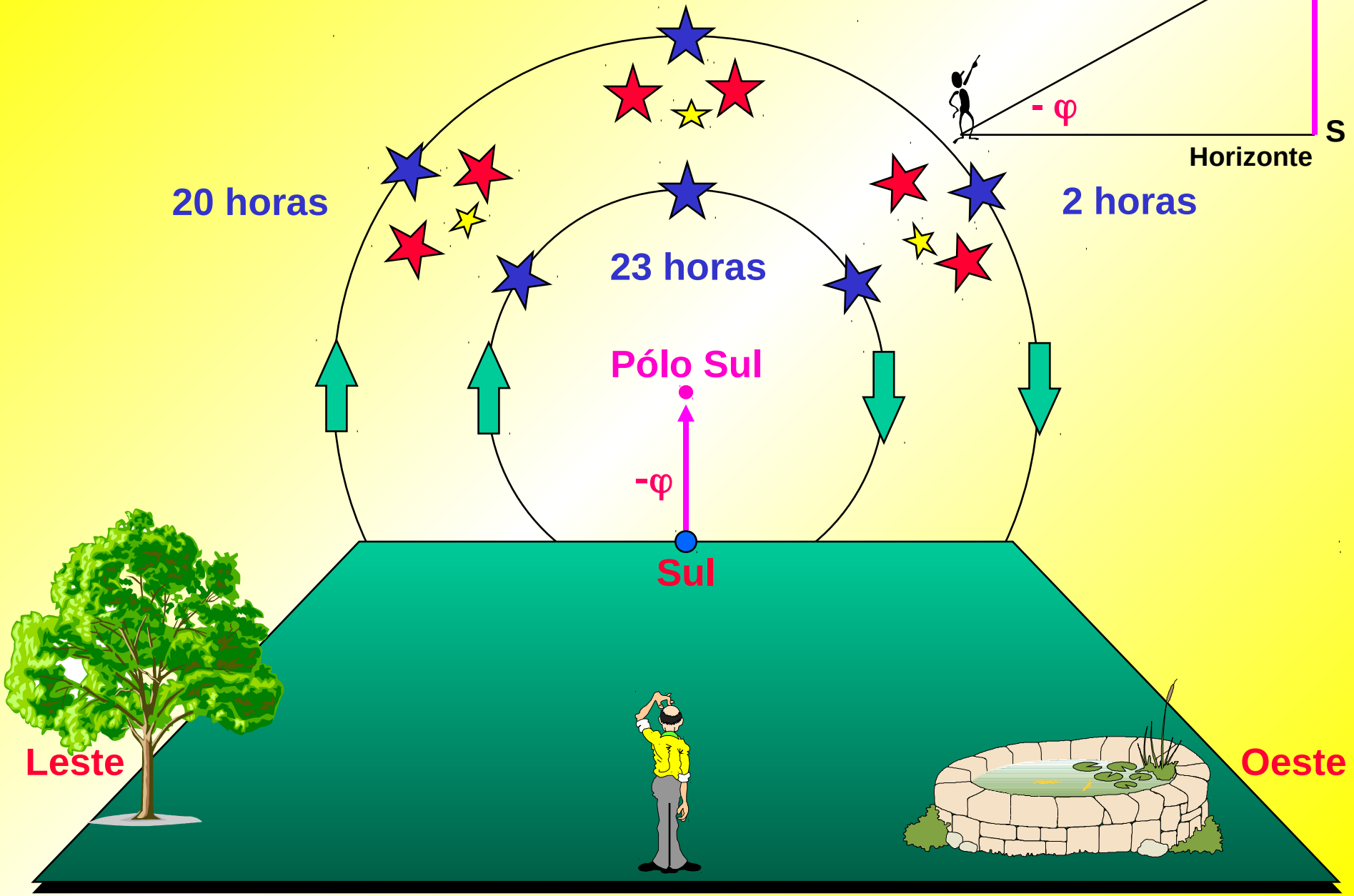




# Latitude astronômica: $\varphi$

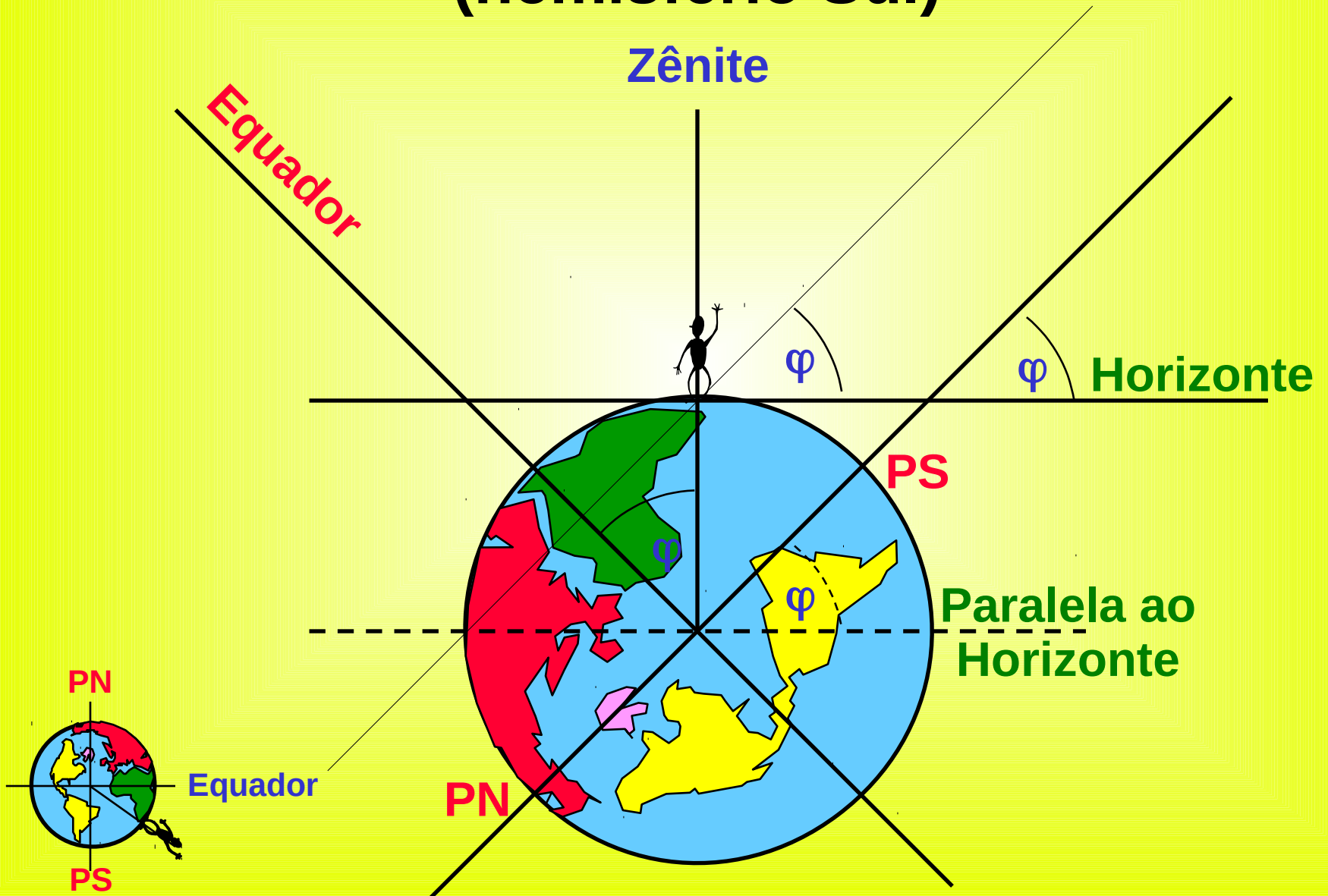


# Latitude astronômica: $\varphi$

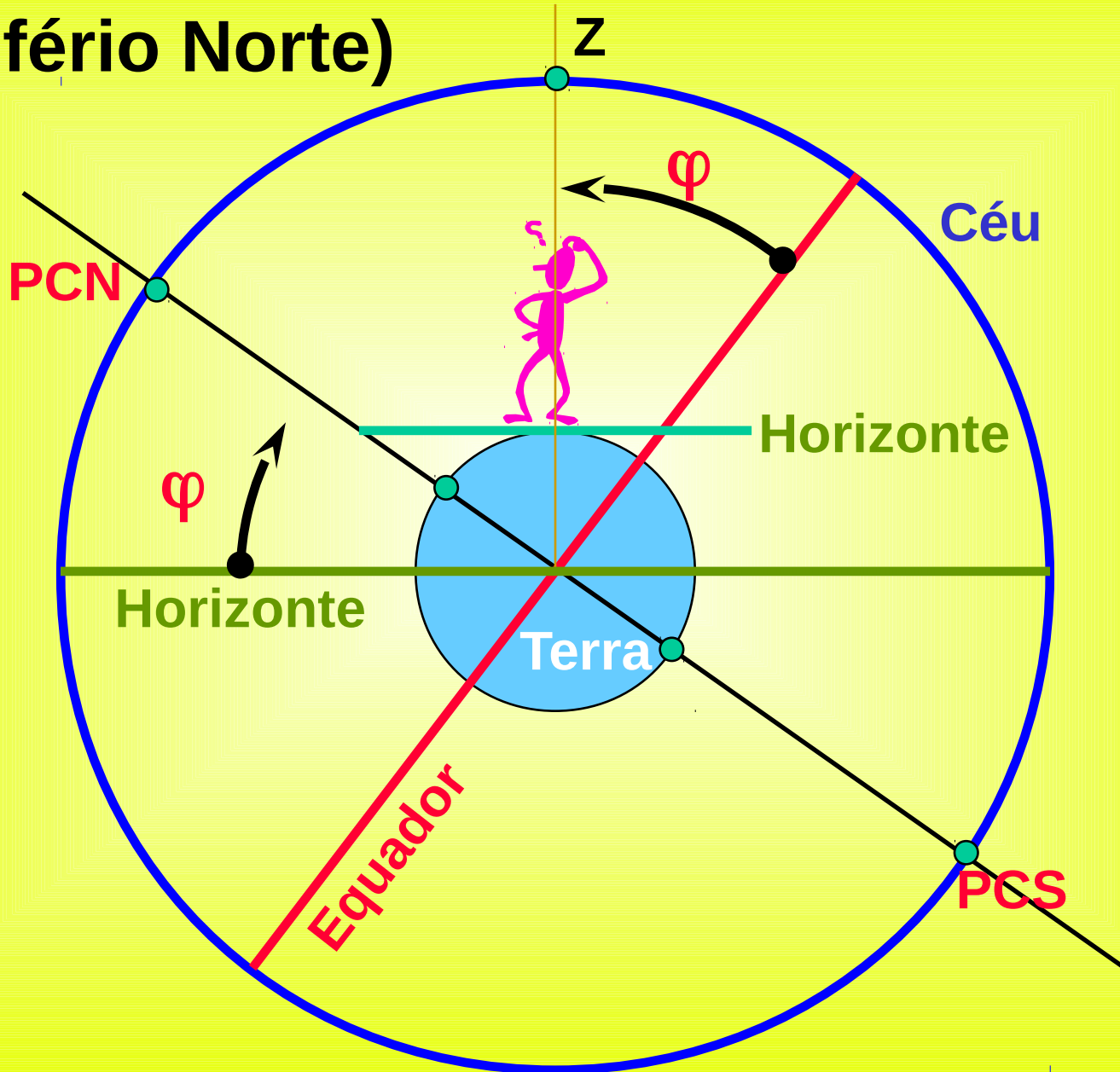


# Latitude astronômica (hemisfério Sul)

PCS



# Latitude astronômica (hemisfério Norte)

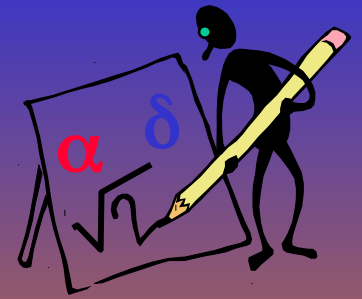


# Portanto: Latitude Astronômica

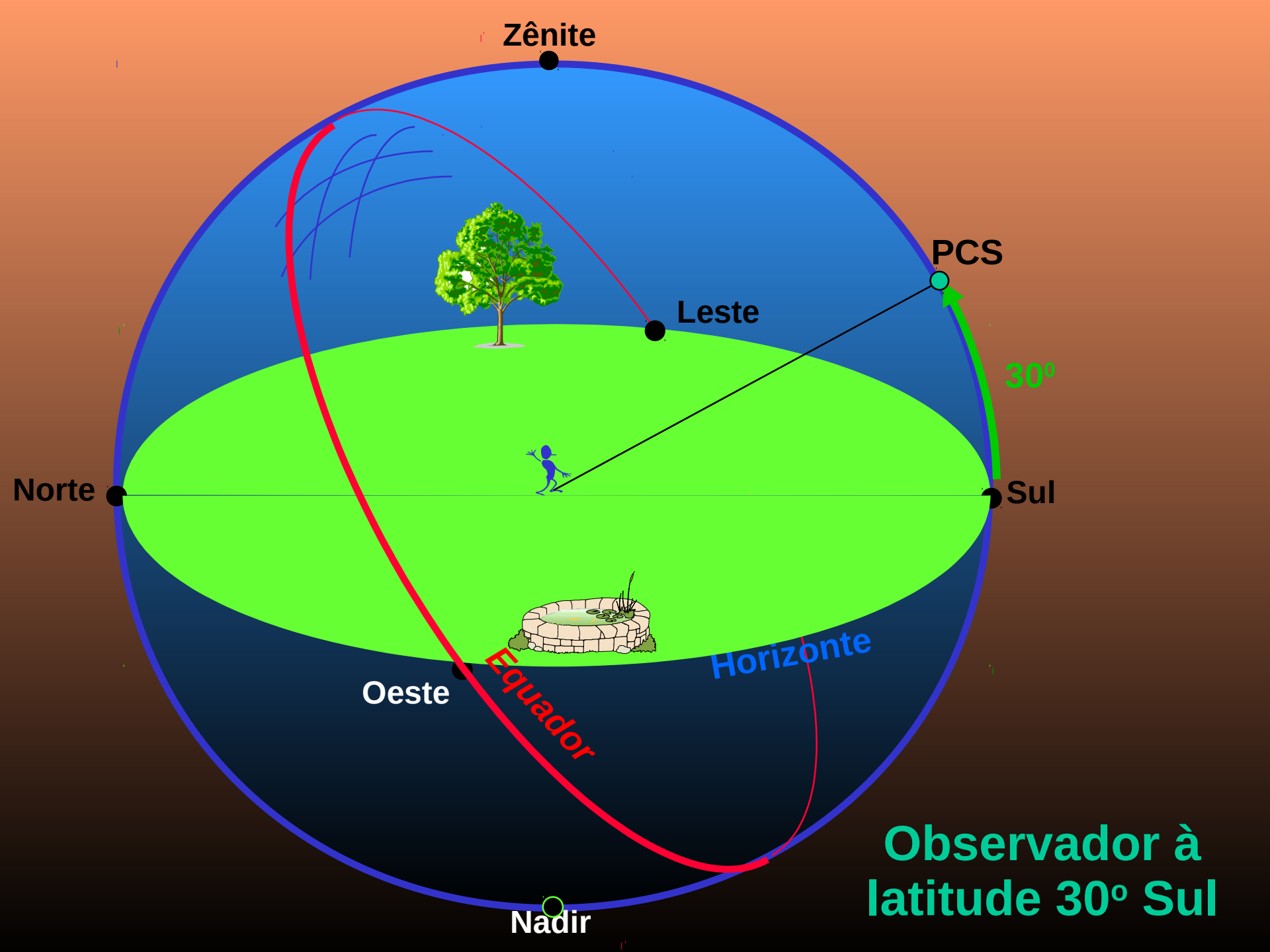


É a altura do Pólo Norte Celeste  
'visto' do local considerado.

É a altura do Pólo Sul Celeste  
'visto' do local considerado,  
impondo o sinal negativo.



# Elementos do céu de acordo com a latitude do observador



Zênite

PCS

Leste

30°

Norte

Sul

Oeste

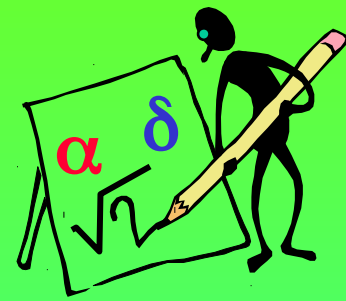
Equador

Horizonte

Observador à latitude 30° Sul

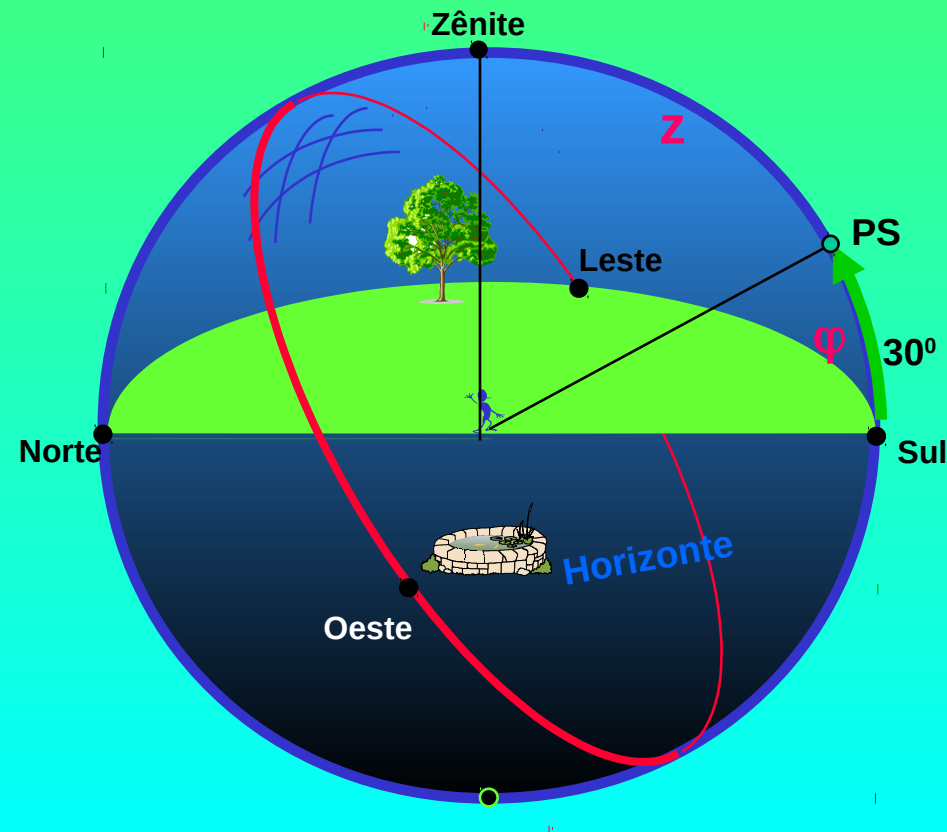
Nádir

# Posição do pólo visível



## Enunciado:

Qual o ângulo entre o pólo sul e o zênite de um observador com latitude astronômica de  $-30^\circ$ ?



$$z + |\varphi_{PV}| = 90^\circ$$

$$z + |-30| = 90^\circ$$

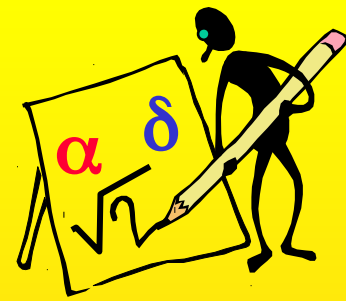
$$z + 30 = 90^\circ$$

$$z = -30 + 90^\circ$$

$$z = 60^\circ$$



# Posição do equador



## Enunciado:

Qual o ângulo entre o equador e o zênite de um observador com latitude astronômica de  $-30^\circ$ ?

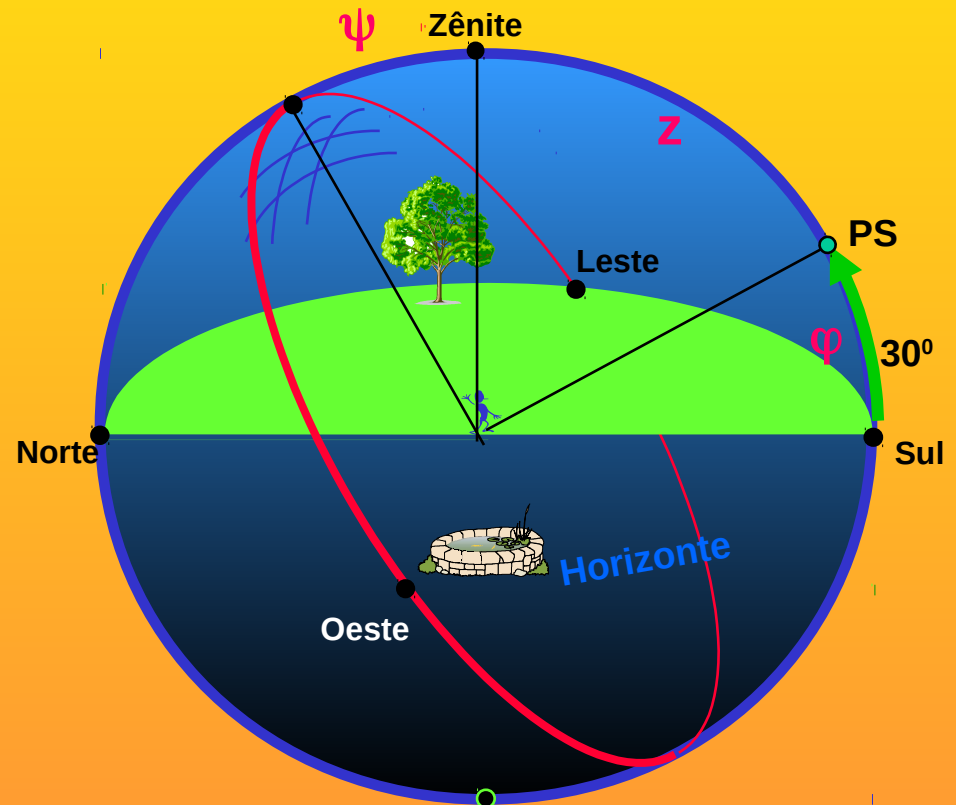
$$z + |\varphi| = 90^\circ$$

$$z + \psi = 90^\circ$$

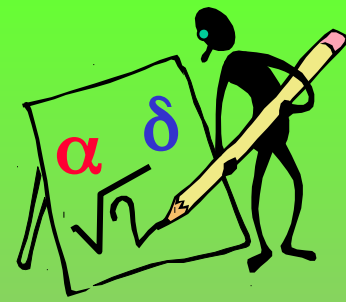
$$z + \psi = z + |\varphi|$$

$$\psi = |\varphi|$$

$$\psi = 30^\circ$$



# Posição do equador



## Enunciado:

Qual o ângulo entre o equador e o horizonte de um observador com latitude astronômica de  $-30^\circ$ ?

$$\psi = |\varphi|$$

$$\eta + \psi = 90^\circ$$

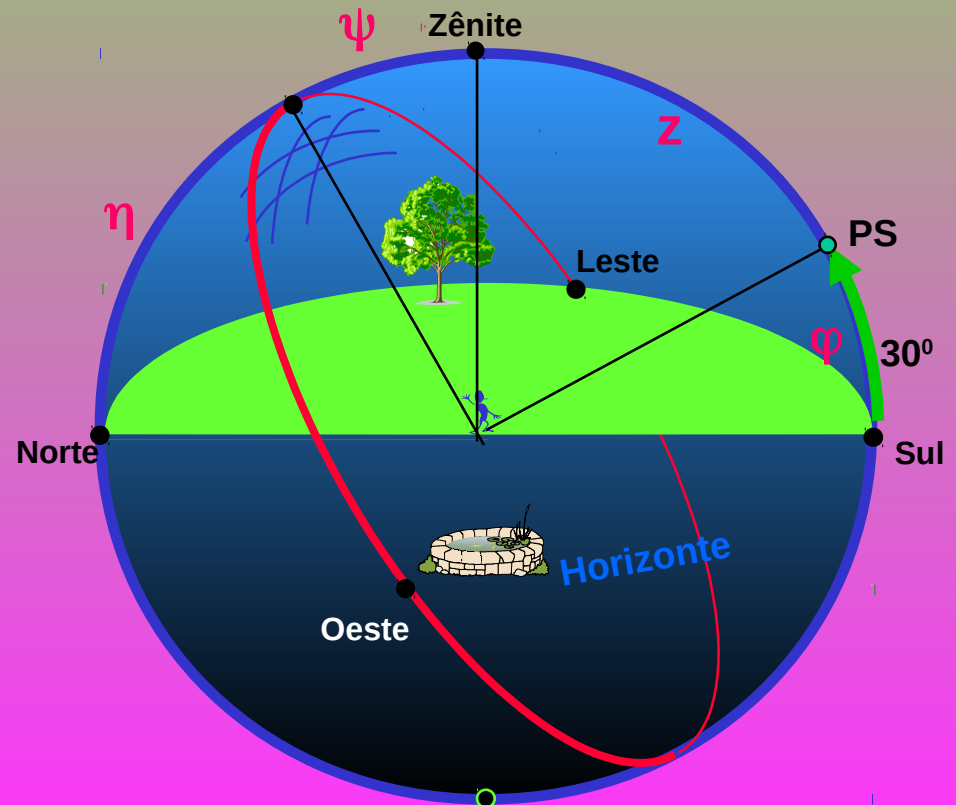
$$\eta = 90^\circ - \psi$$

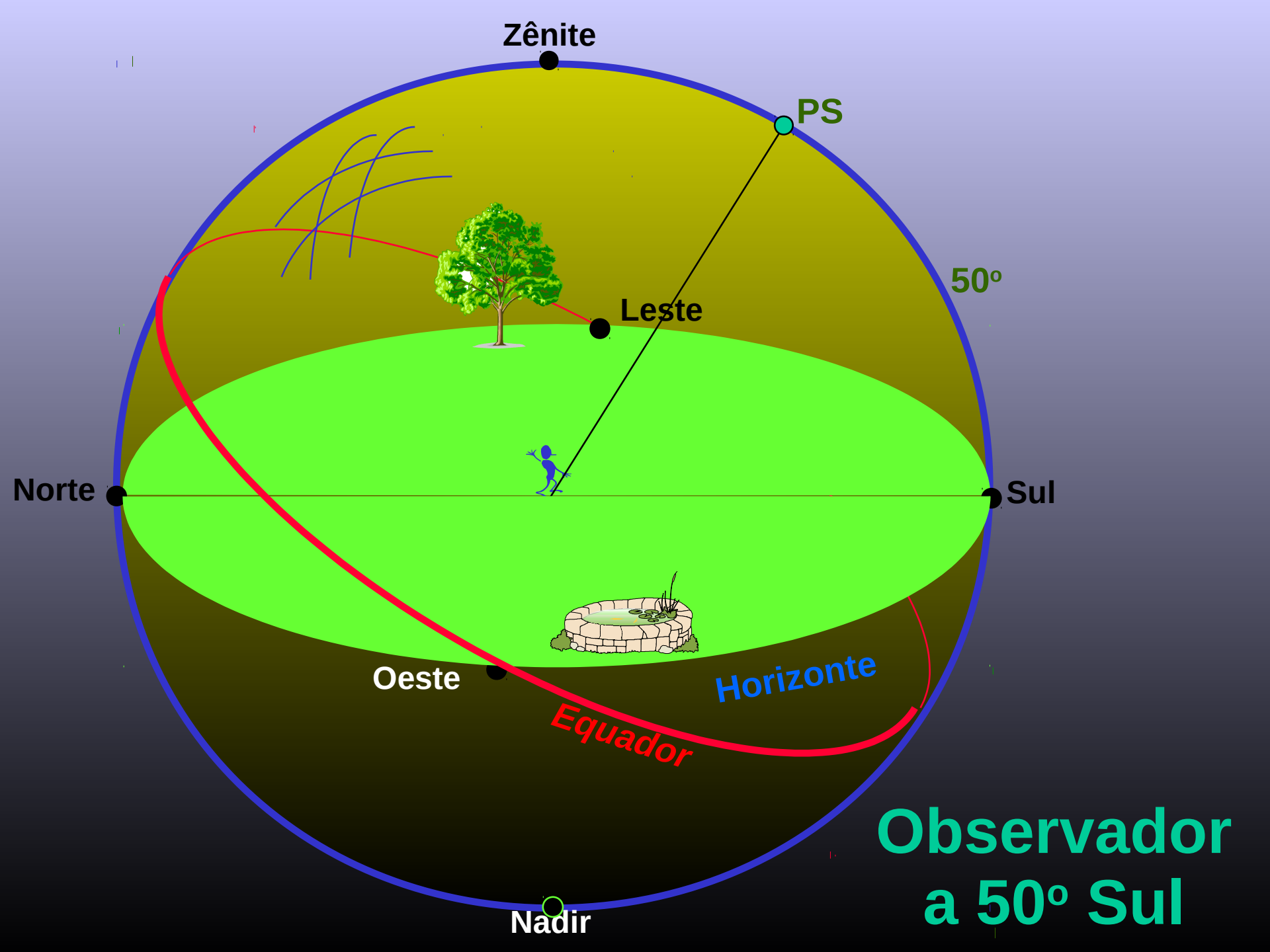
$$\eta = 90^\circ - |\varphi|$$

$$\eta = 90^\circ - |-30^\circ|$$

$$\eta = 90^\circ - 30^\circ$$

$$\eta = 60^\circ$$





Zênite

PS

50°

Leste

Norte

Sul

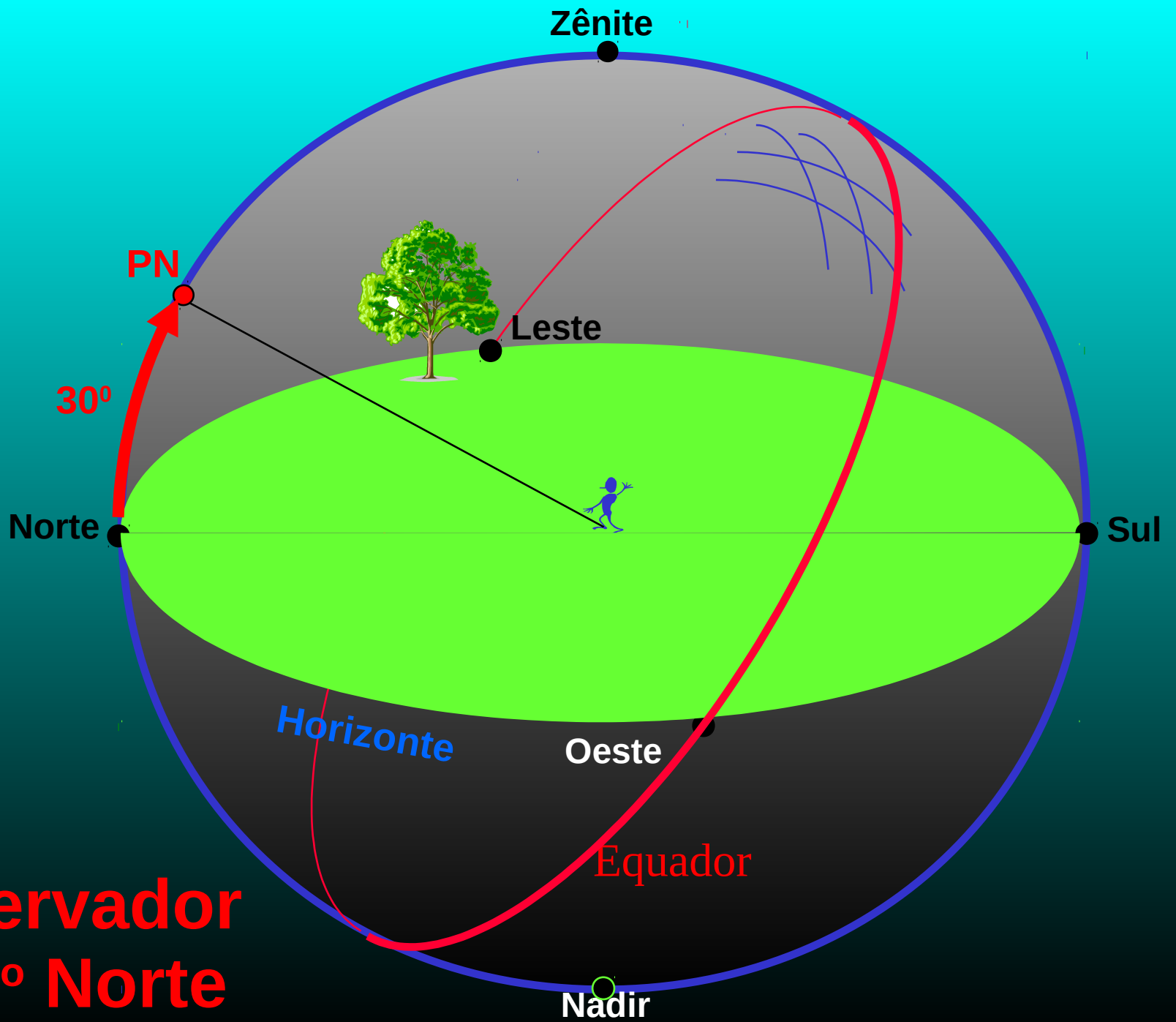
Oeste

Horizonte

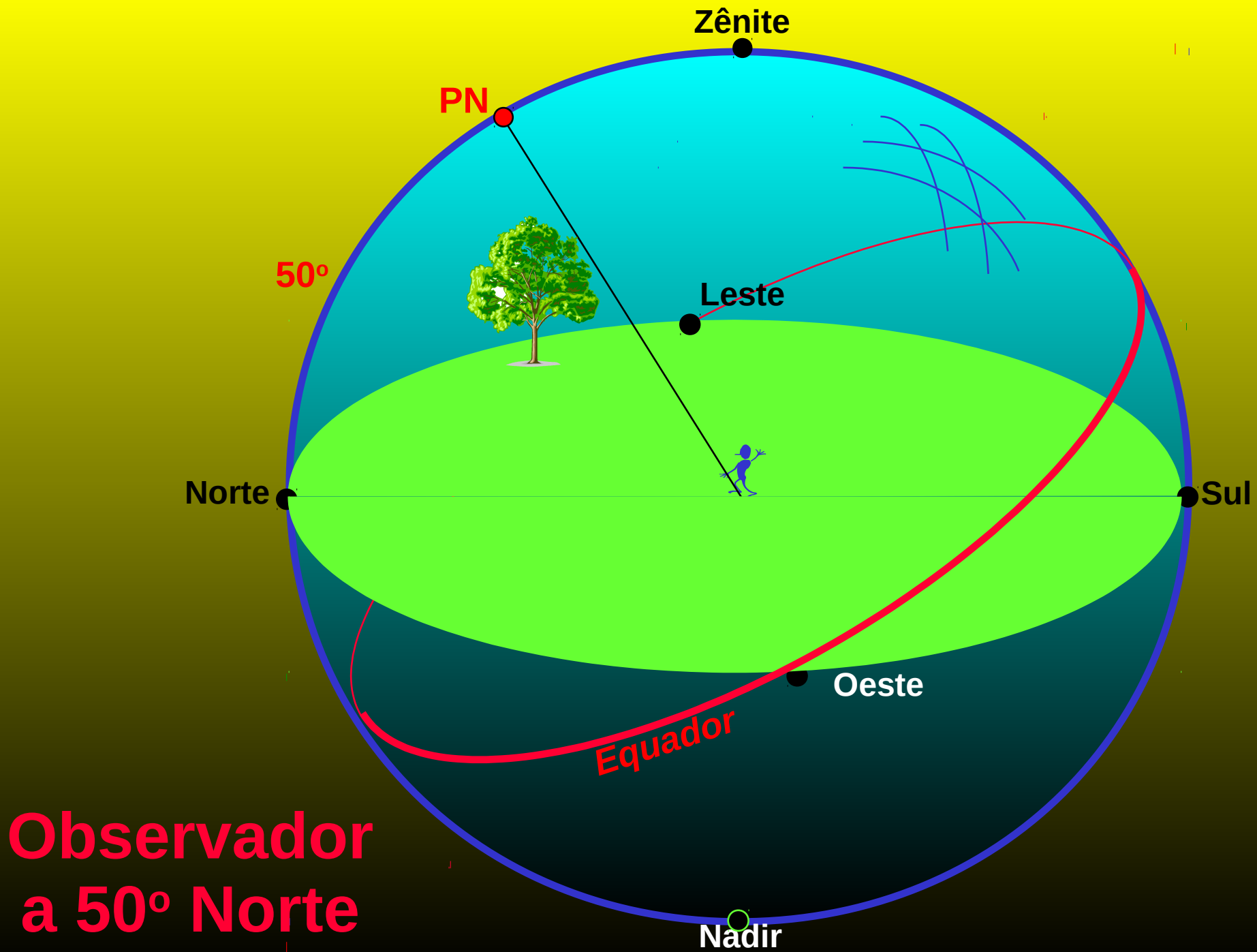
Equador

Observador  
a 50° Sul

Nádir

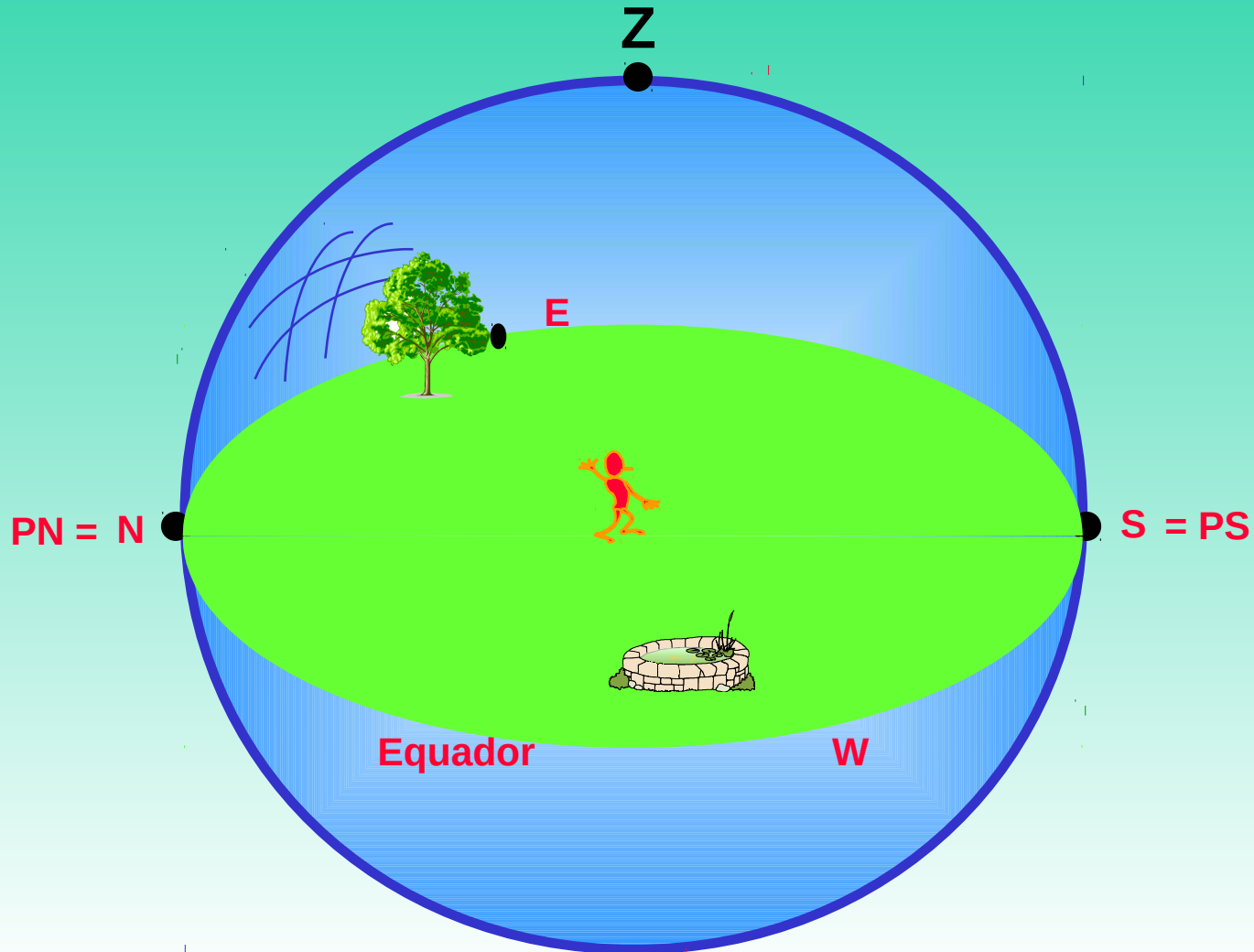


**Observador  
a 30° Norte**

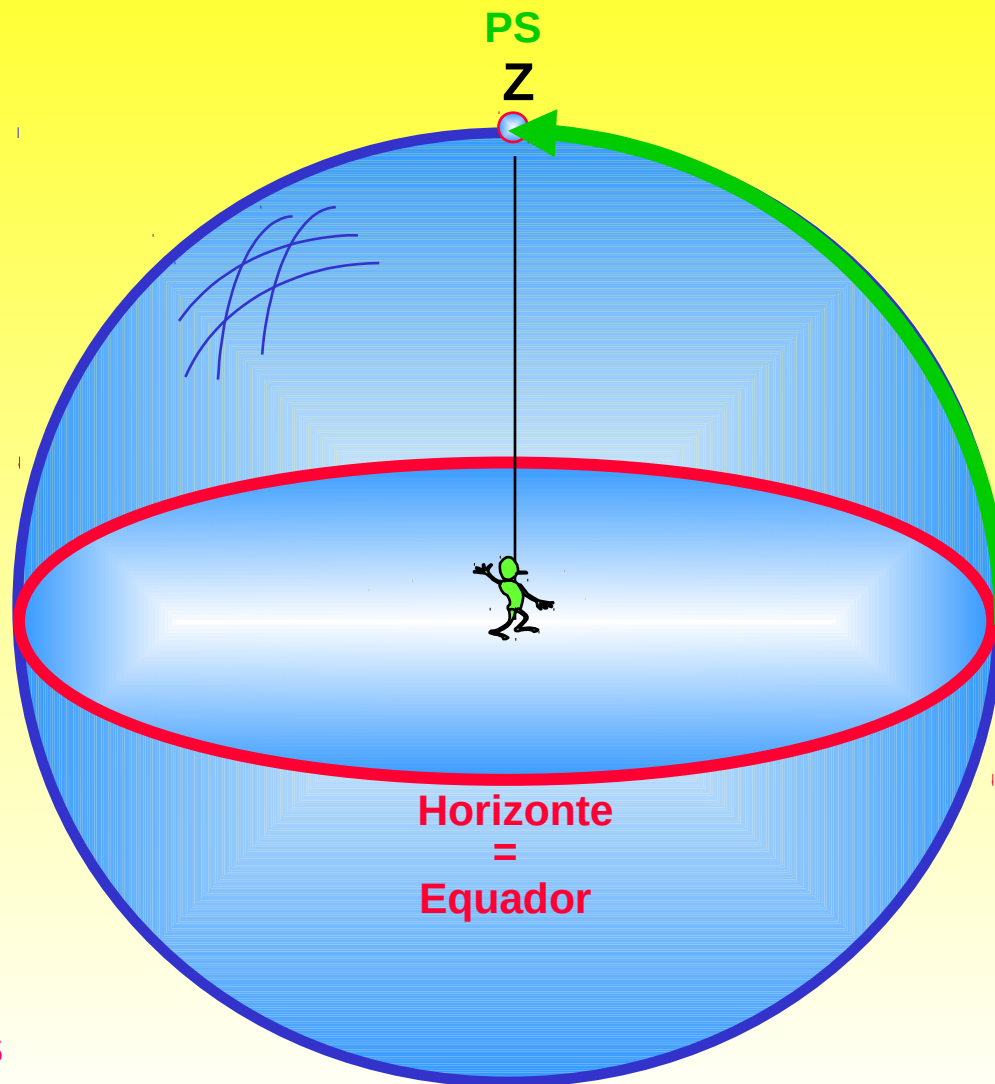


**Observador  
a 50° Norte**

# Observador no equador: Latitude $0^\circ$

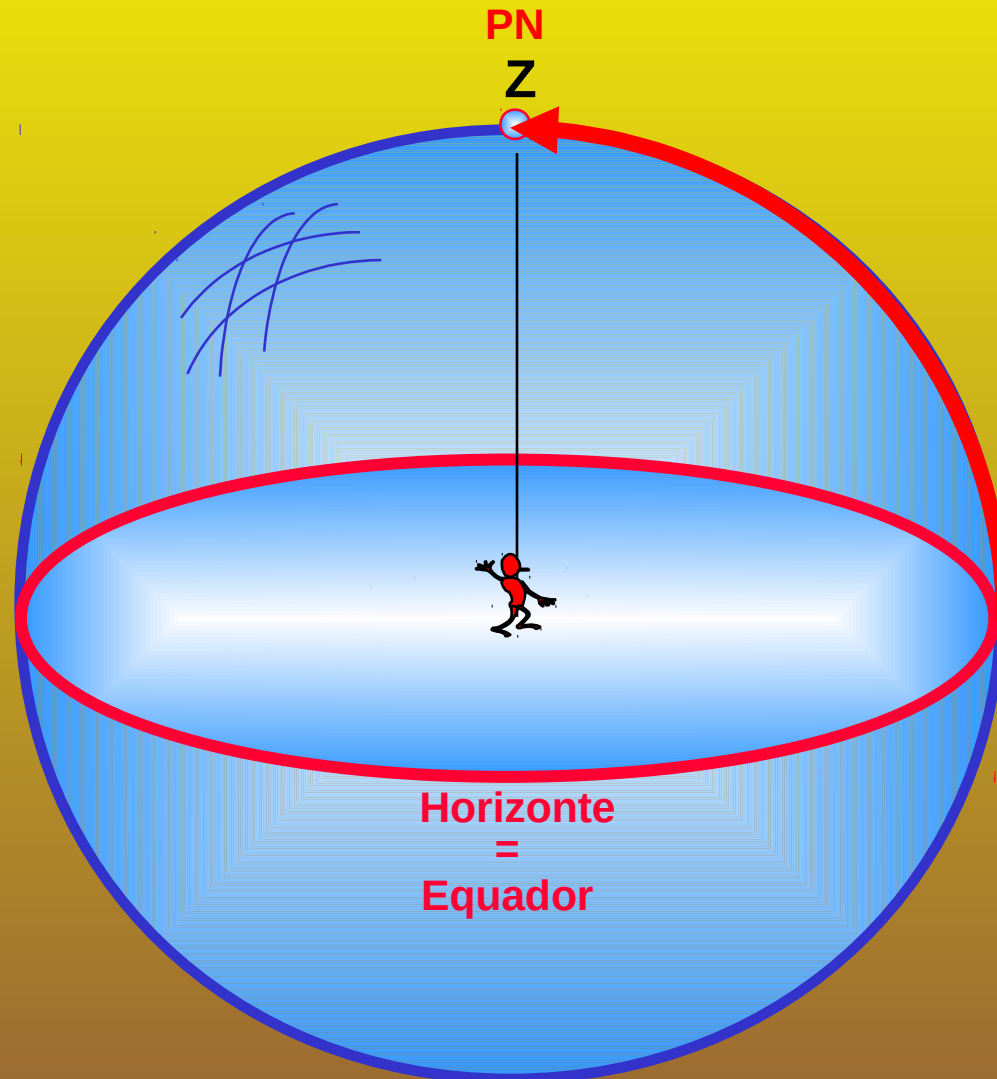


# Observador no Pólo Sul: Latitude $-90^\circ$



Os pontos  
cardiais não  
estão definidos

# Observador no Pólo Norte: Latitude $+90^\circ$







**Fim**