

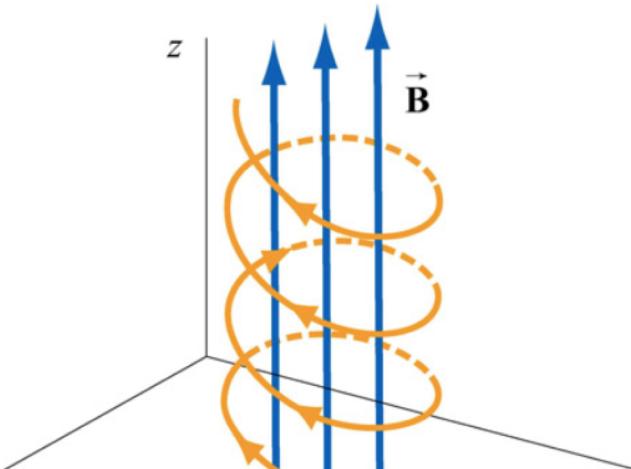
# Introduction à la physique des plasmas – Cours 6

<http://ttpoll.eu>

session ID: introplasma

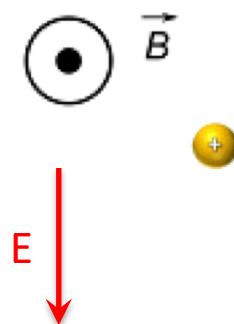
# Est-ce un ion ou un électron?

- A. un électron
- ✓ B. un ion



# Vers où va dériver ce ion?

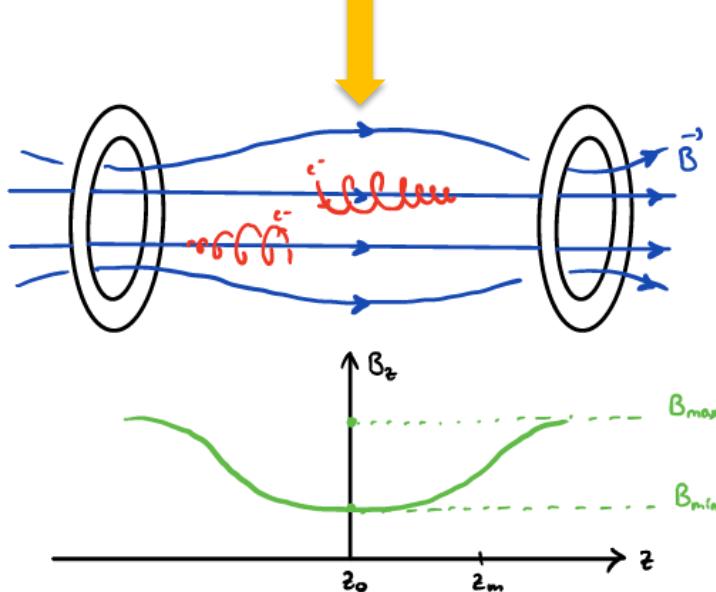
- A. vers la droite
- B. vers la gauche
- C. vers le bas



# B inhomogène produit deux forces

$$F_{||} = -\mu \frac{\partial B_z}{\partial z} \Big|_{\vec{r}_3}$$

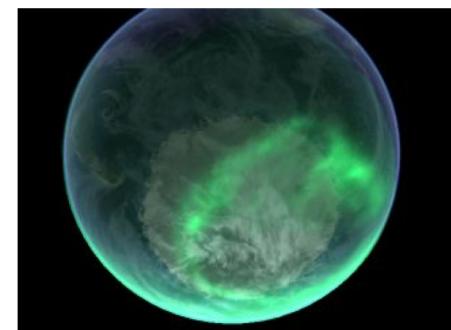
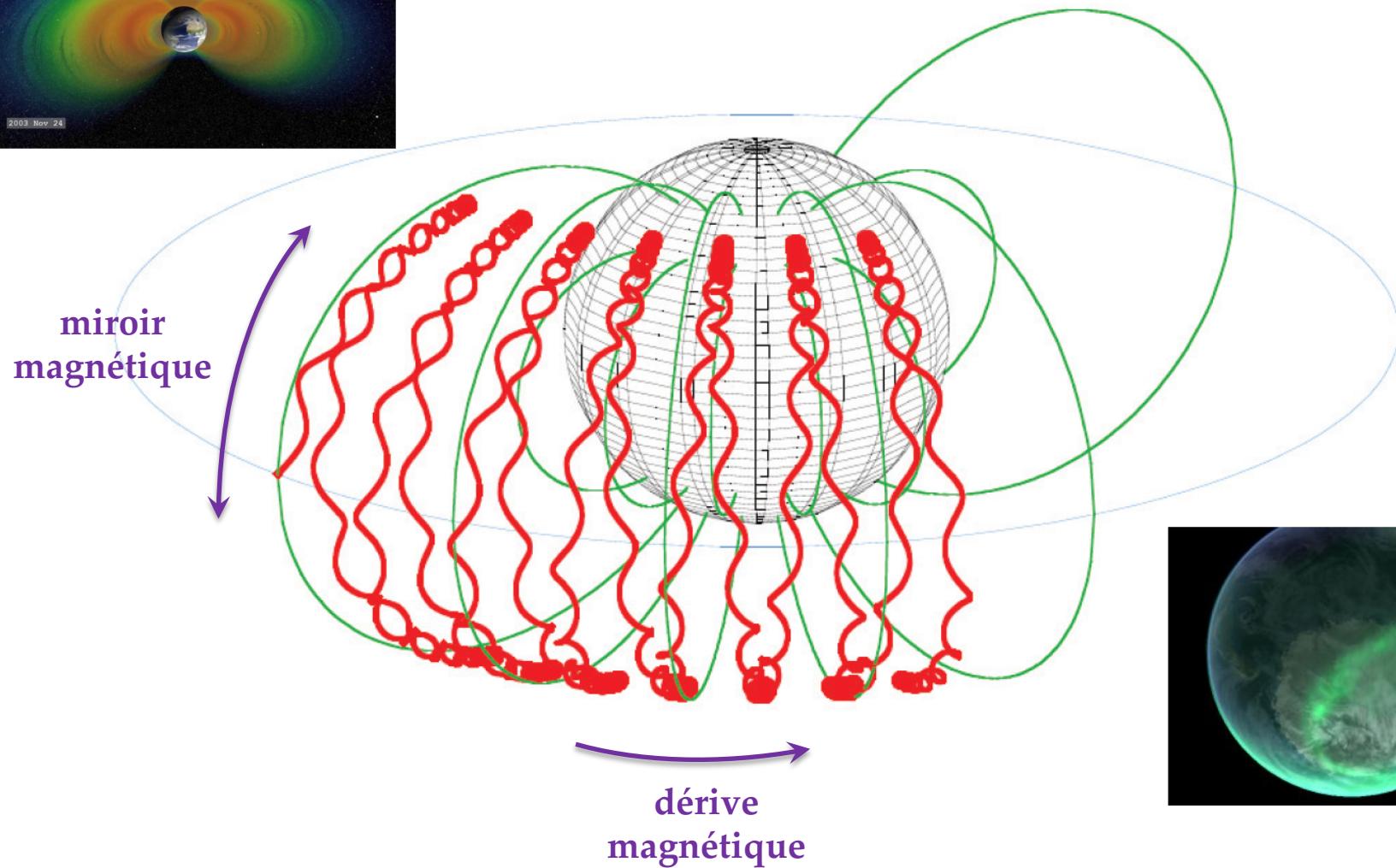
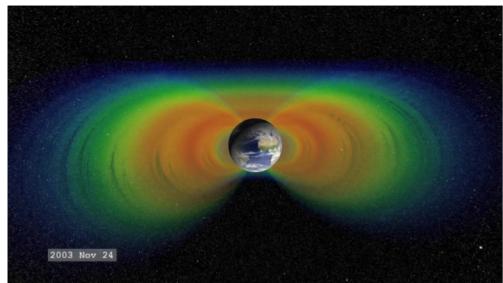
$$\langle \vec{F}_{\perp} \rangle = -\mu_2 \frac{\vec{\nabla}_{\perp} B^2}{B}$$



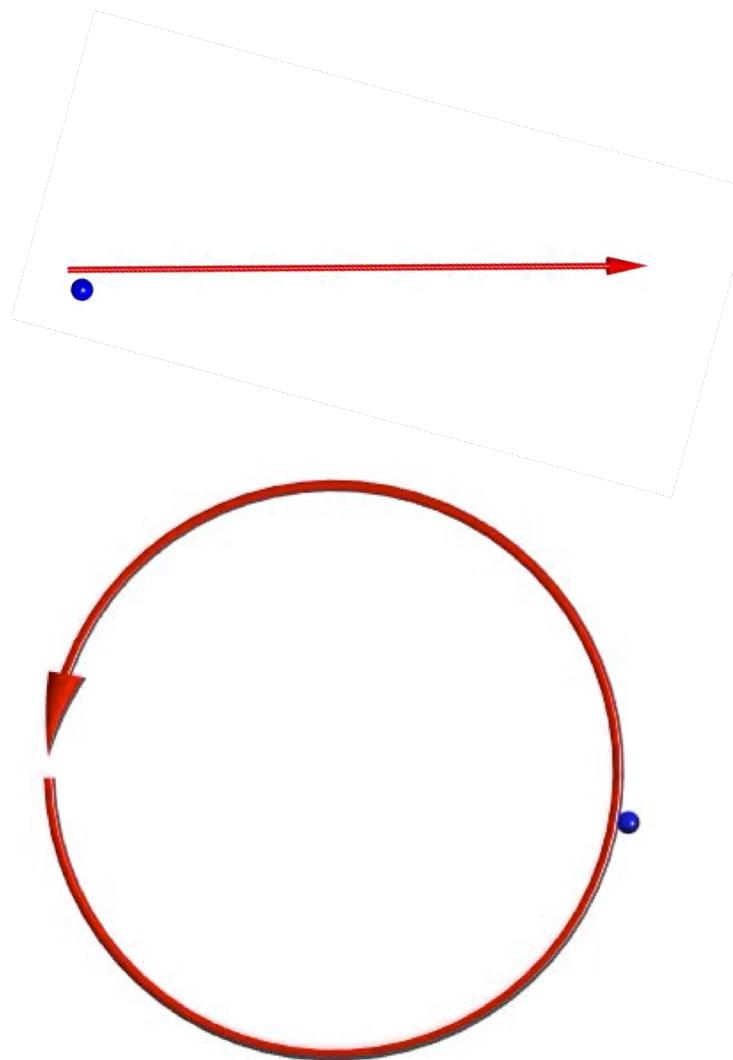
$$\vec{v}_{\nabla B} = \frac{\mu}{q} \frac{\vec{B} \times \vec{\nabla} B}{B^2}$$

$$\alpha = \frac{v_{\perp}}{v} \quad \alpha^2 > \frac{1}{R_m}$$

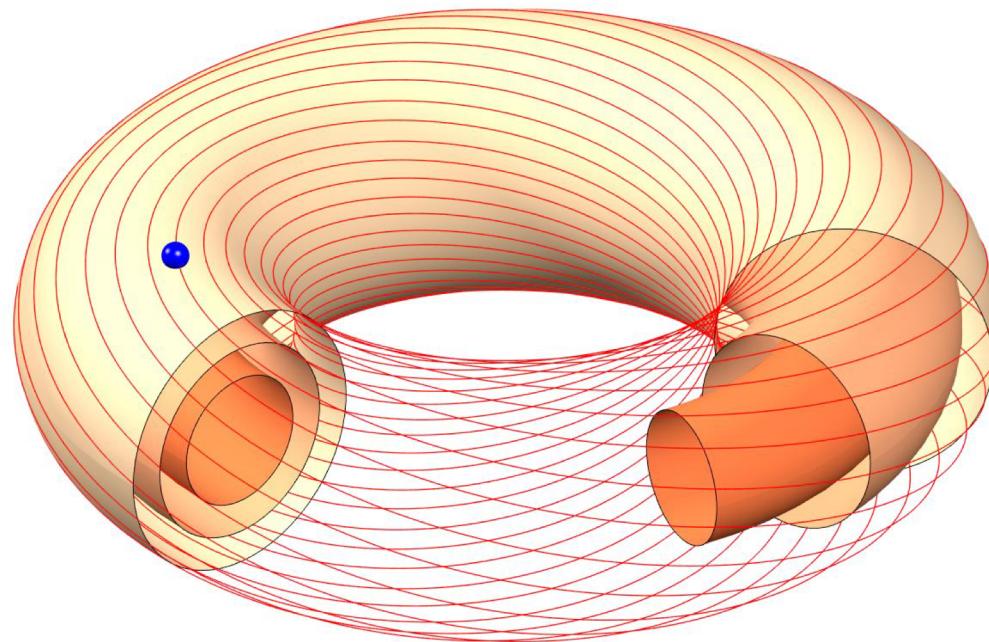
# La Terre agit comme un miroir magnétique



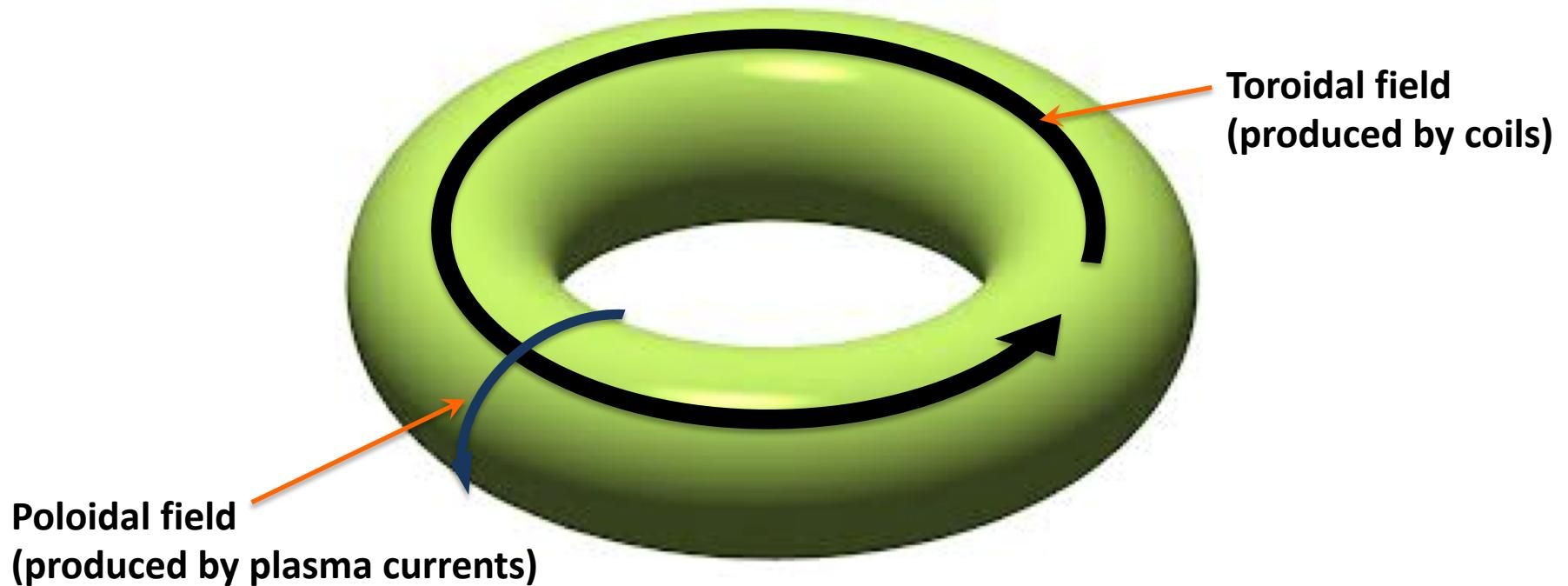
Un **B** toroidal seul ne peut pas confiner des particules



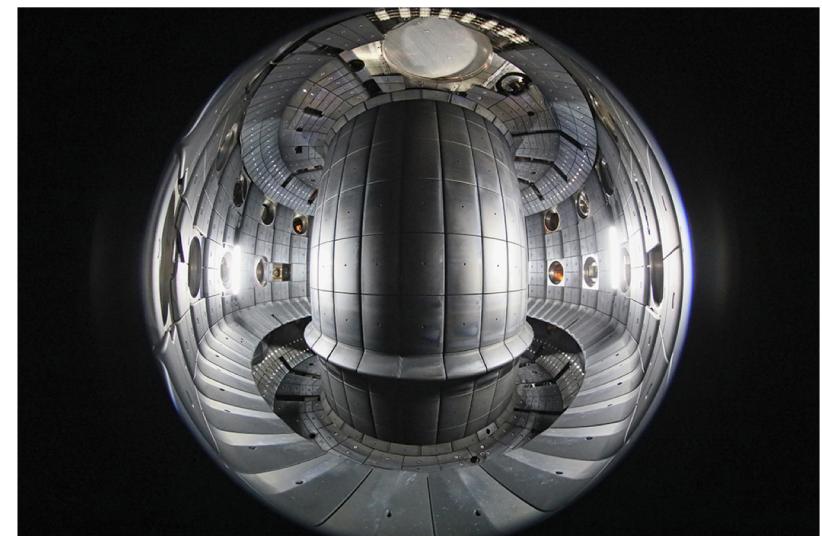
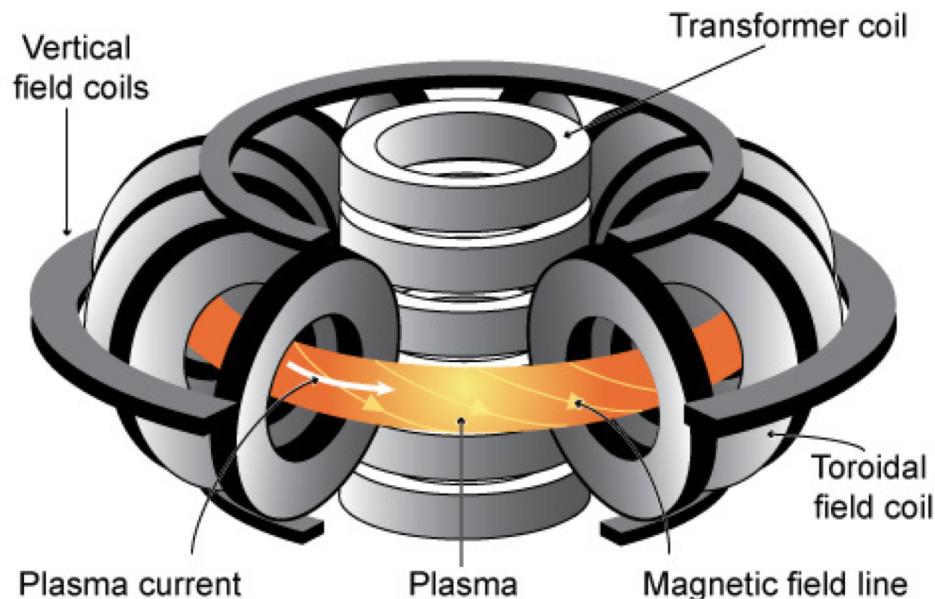
Confinement parfait peut s'obtenir avec un **B** hélicoïdal



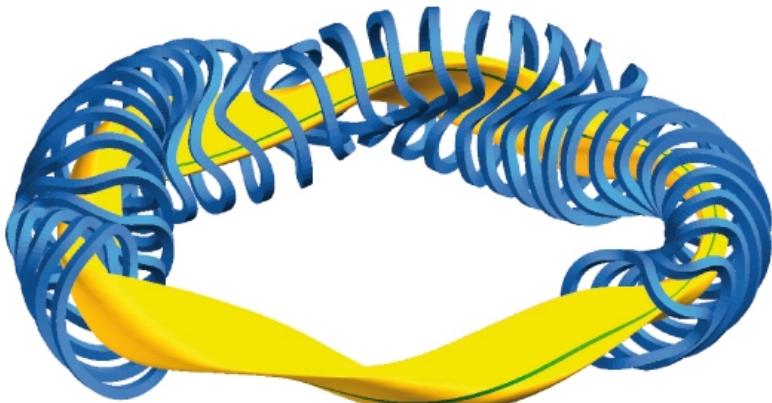
# Confinement parfait peut s'obtenir avec un **B** hélicoidal



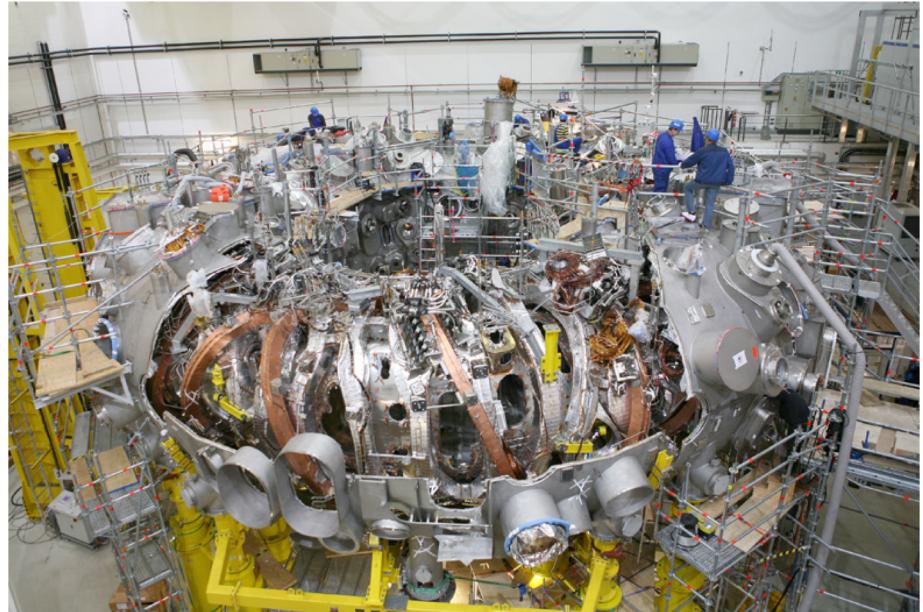
# Le concept du tokamak



# Stellarators: une alternative fascinante



Wendelstein 7-X (Germany)



Pas besoin de courant dans le plasma!

- ❖ intrinsèquement stationnaire
- ❖ plus stable