L'Open Innovation au service de l'Open Rotor

Le moteur du futur

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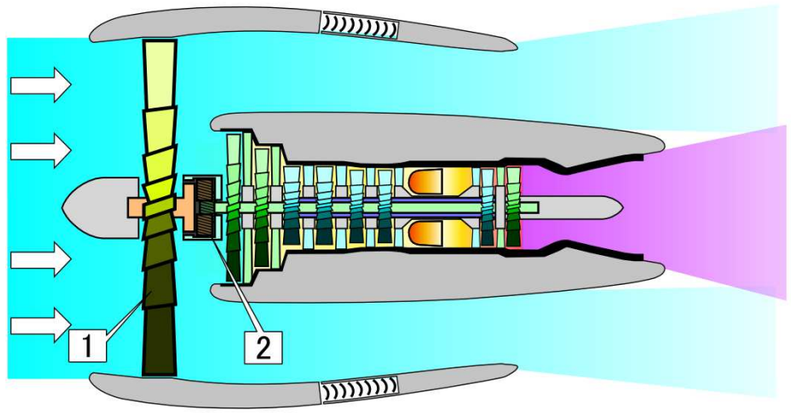
SAFRAN
AEROSPACE · DEFENCE · SECURITY

AIRBUS GROUP

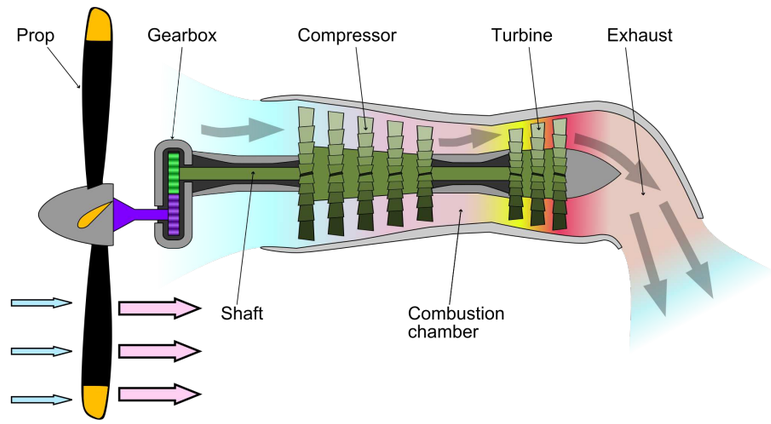
LMT CACHAN

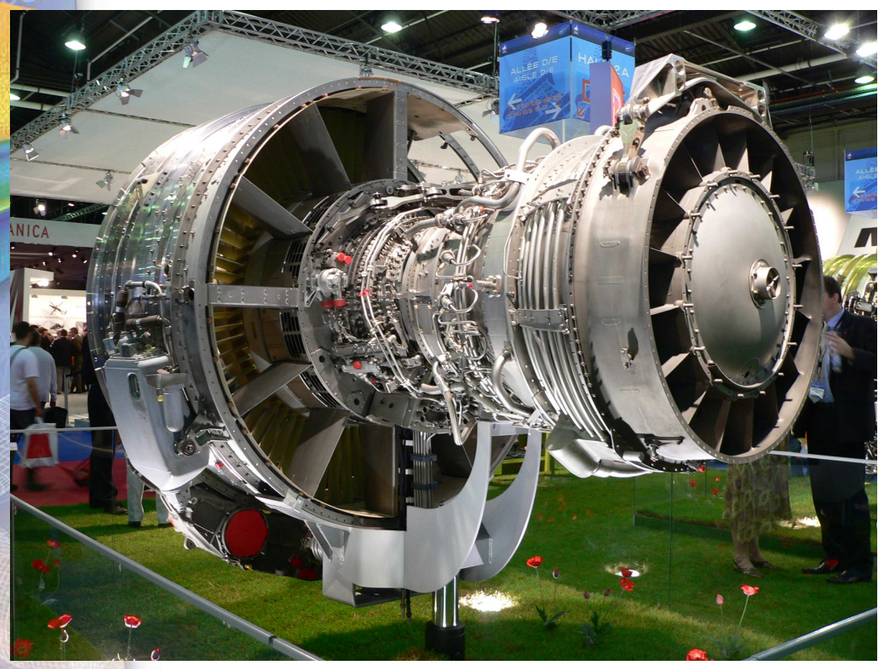
Context

TURBO-FAN



- The most diffused engine in aeronautics.
- Inefficient with respect TURBO-PROP engines.

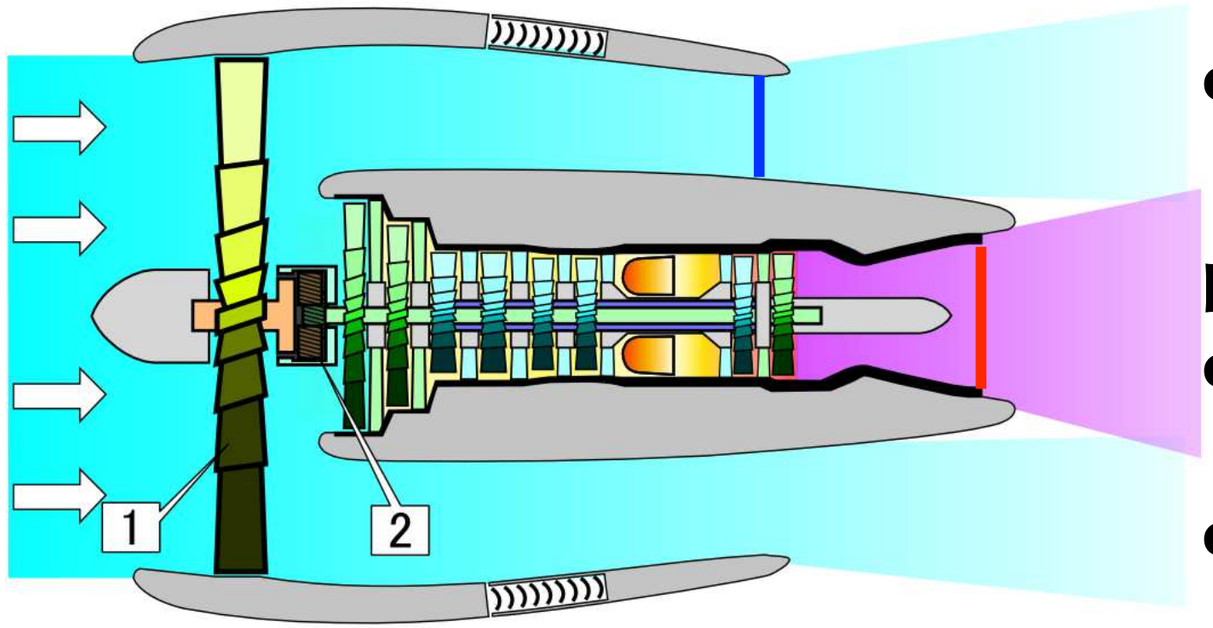




- This is up to 2 times more efficient during take off, rising and landing stages.
- On the other hand TURBO-FAN is faster and efficient during cruise stage.

Context

TURBO-FAN



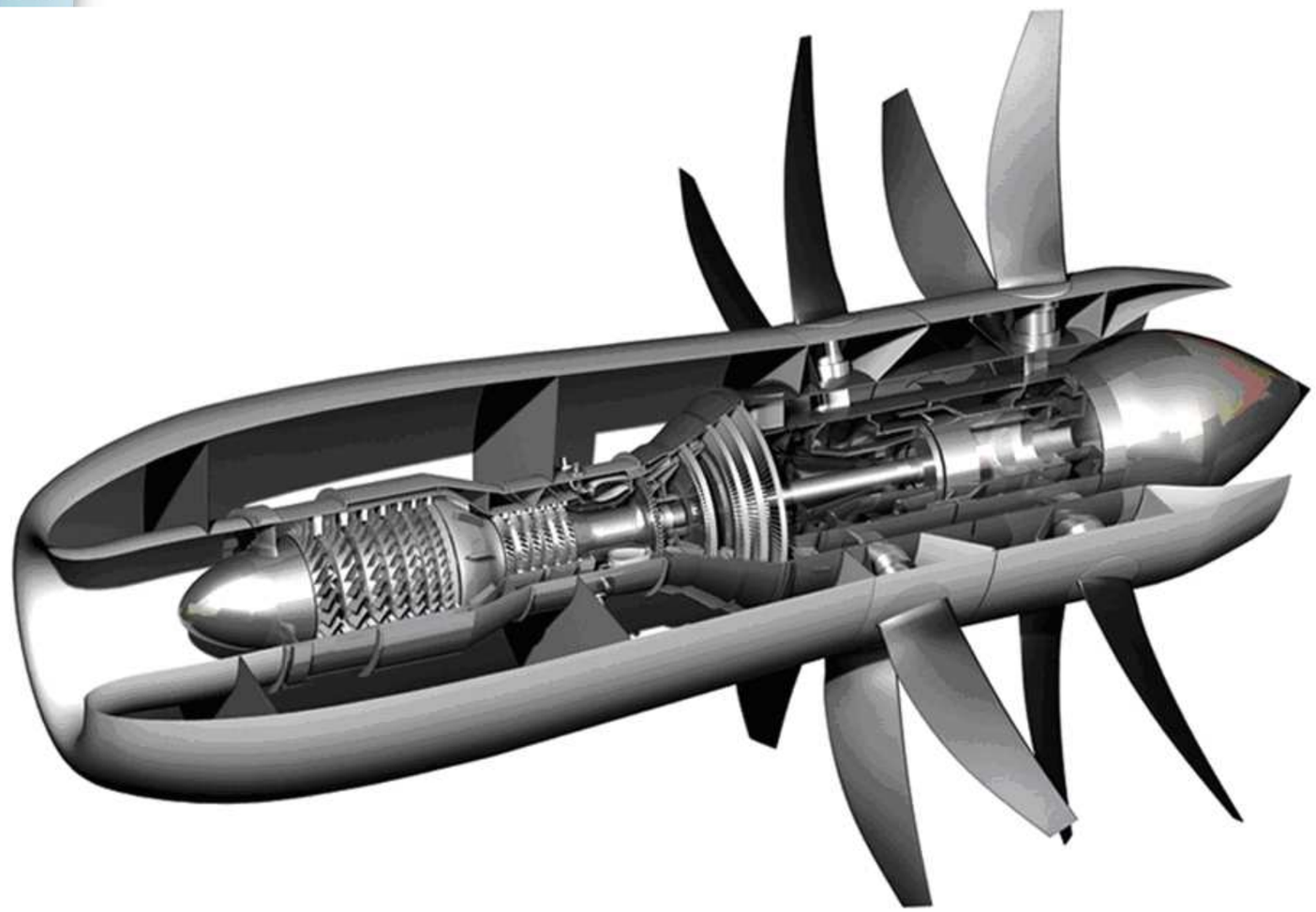
$$\frac{2 \times |}{\quad} = \text{by-pass ratio} \longrightarrow$$

- The more and more high during the last 30 years.
- Nowadays is 20.
- IDEAL by-pass = 100

TECHNOLOGICAL BREAKTHROUG

Our idea of engine

OPEN ROTOR



by-pass ratio : 100

Fuel saving : 50%
CO_2 and NO_2 emissions : - 80%

- Drag and dissipation are proportional to the square of the velocity impressed to the fluid.
- Open rotor pushes few a big mass of fluid : TRUST without DRAG.
- Saving in fuel and CO_2 – NO_2 emissions

Safran

Aerospace - Defence - Security

En chiffres

- 14,7 Mds de chiffre d'affaire en 2013
  - 1,8 Mds pour la recherche, 12
- 62 500 personnes

Rôle

- Fournir le modèle de l'open rotor
- Construire le démonstrateur
- Fournir la puissance de calcul

Airbus Groupe

Anciennement EADS

En chiffres

- 59,3 Mds de chiffre d'affaire en 2013
  - un item de deuxième niveau
- 140 000 personnes

Rôle

- Fournir les caractéristiques de l'avion
- Mise en place du nouveau modèle utilisant le moteur sur le marcher
- Réaliser le test du démonstrateur

LMT

Laboratoire de mécanique et technologie

En chiffres

- 98 Doctorants
- ∼60 publication/an
  - un item de deuxième niveau

Rôle

- Adapter les méthodes de calcul aux pointes de la recherche à l'utilisation sur le cas industriel.
- Former du personnel industriel pour l'application de la méthode.

Planning

	2014	2015	2016	2017	2018
LMT	Composite materials modelling/Model reduction	Composite materials modelling/Model reduction	Composite materials modelling/Model reduction		
Snecma		Design/Method development	Design/Method development	Prototype construction	
AIRBUS Group			Wing-motor interaction/ Flying behavior	Wing-motor interaction/ Flying behavior	Flying test

- **Two PhD theses ANR/CIFRE are starting from the collaboration between LMT-Cachan and Snecma**