

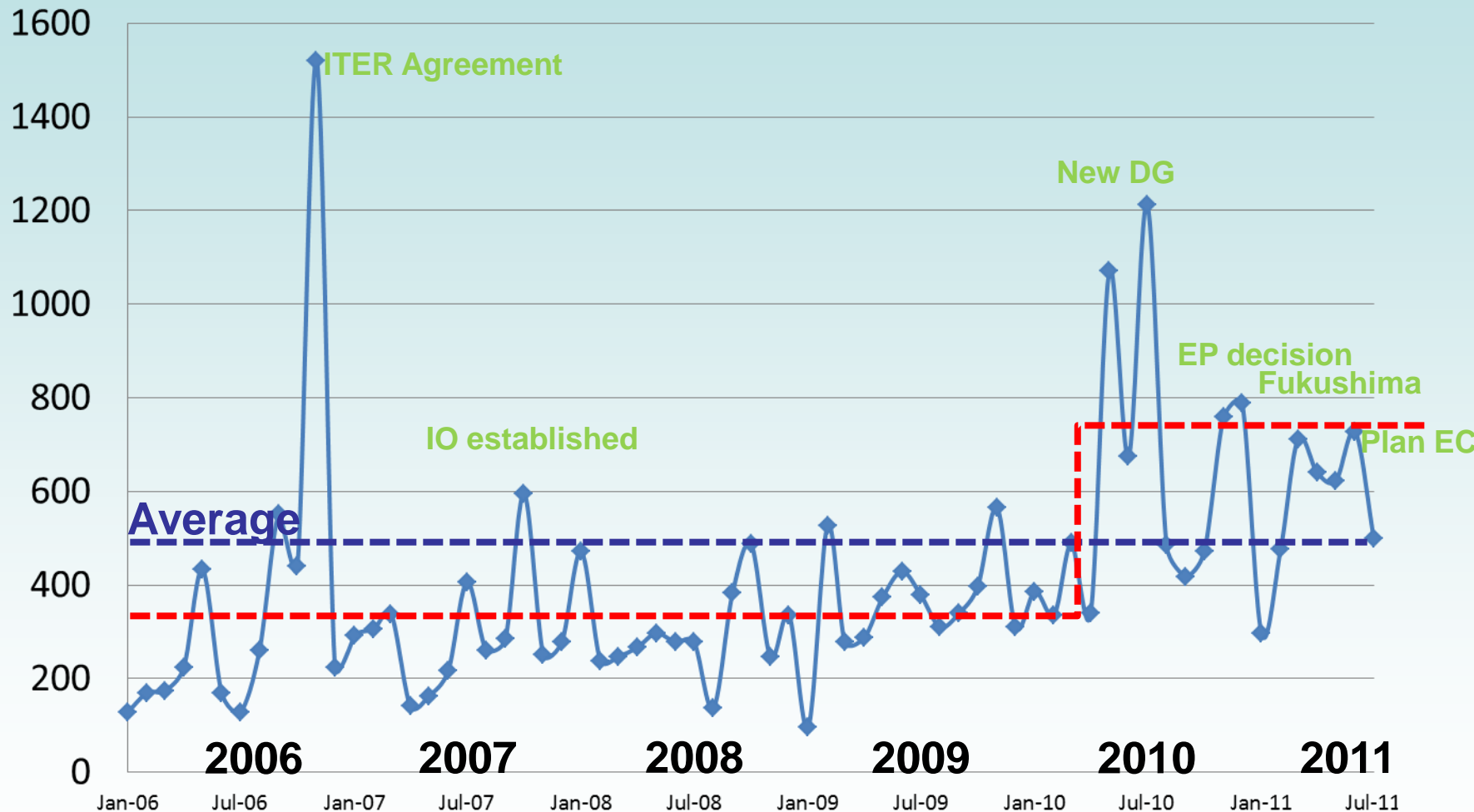
# Can science be transparent?



Michel Claessens  
Head of Communication  
ITER Organization

# ITER in the press 2006-2011

Nr of articles / month quoting 'ITER'



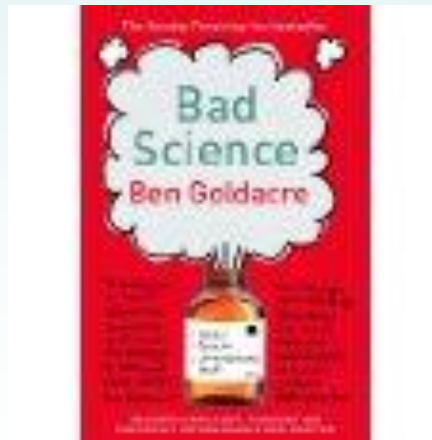
Source: Meltwater news reports

# ITER today



# Successful science communication

- There are only 3 types of science reports in the press (Ben Goldacre, *Bad Science*)
  1. The wacky stories (« money for nothing »)
  2. The 'breakthrough' stories and
  3. The 'scare' stories

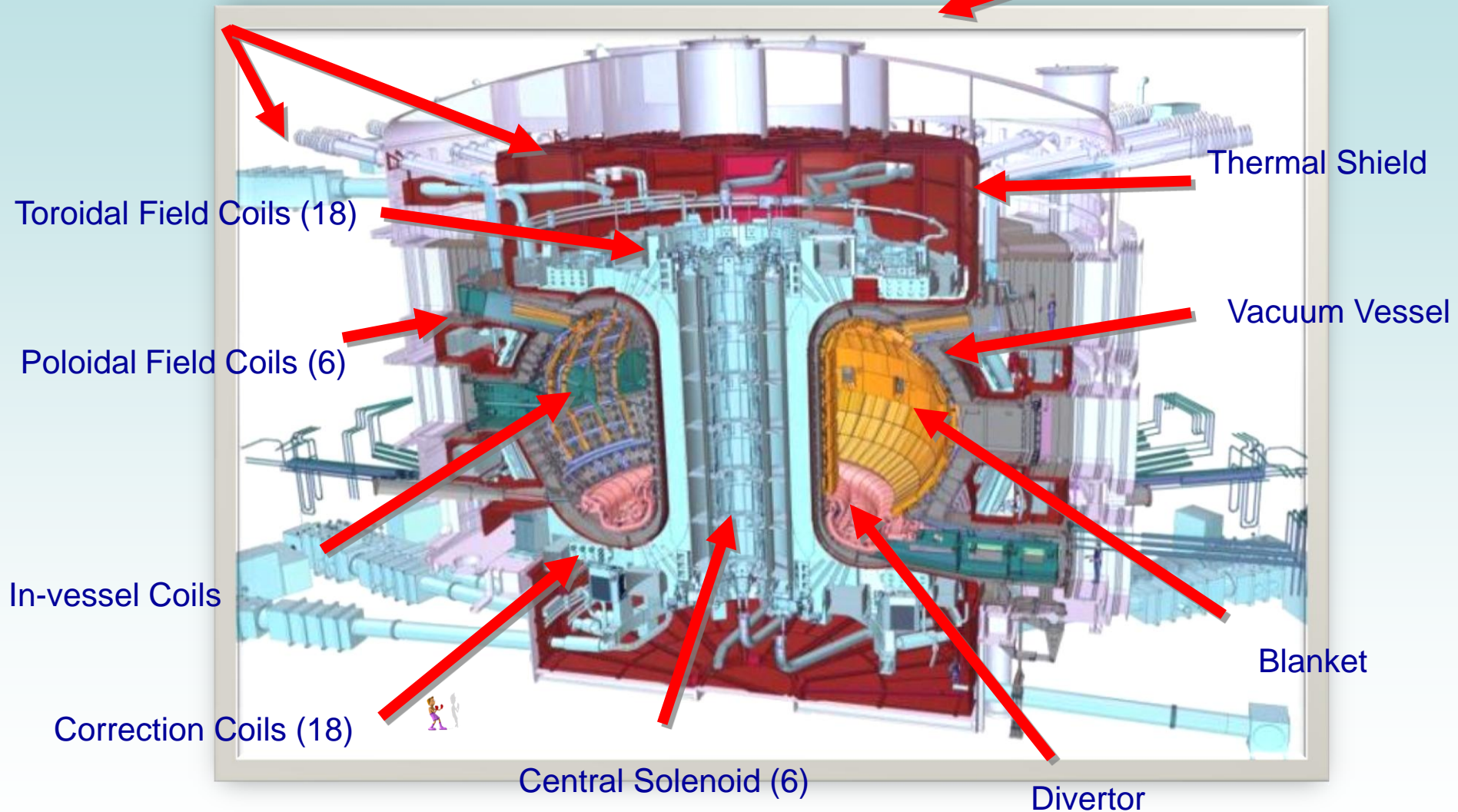




# ITER Tokamak

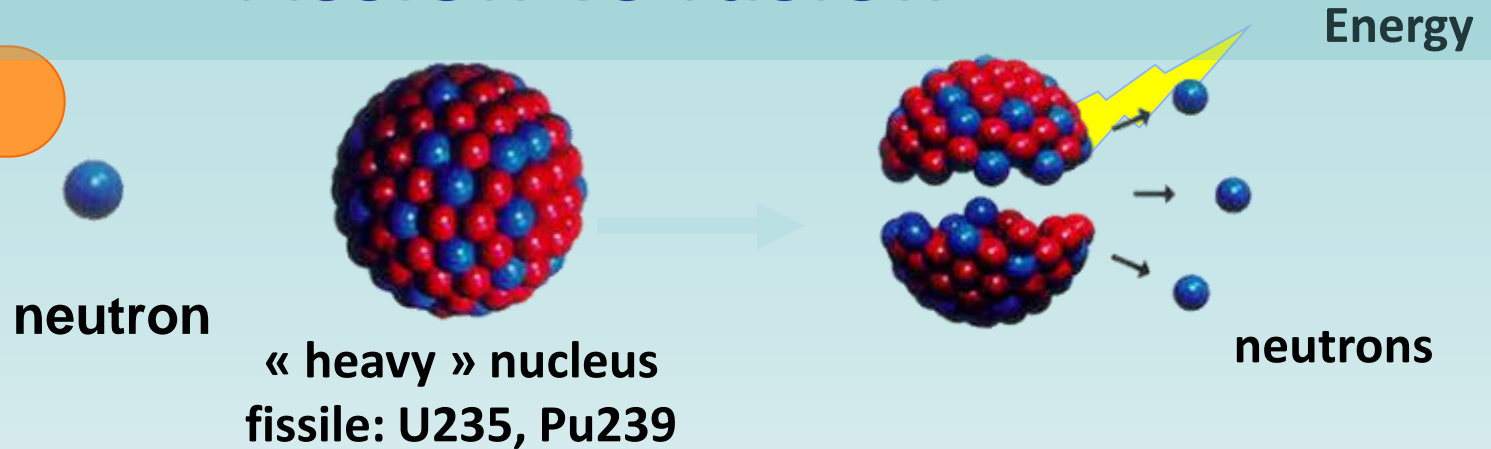
Feeders (31)

Cryostat

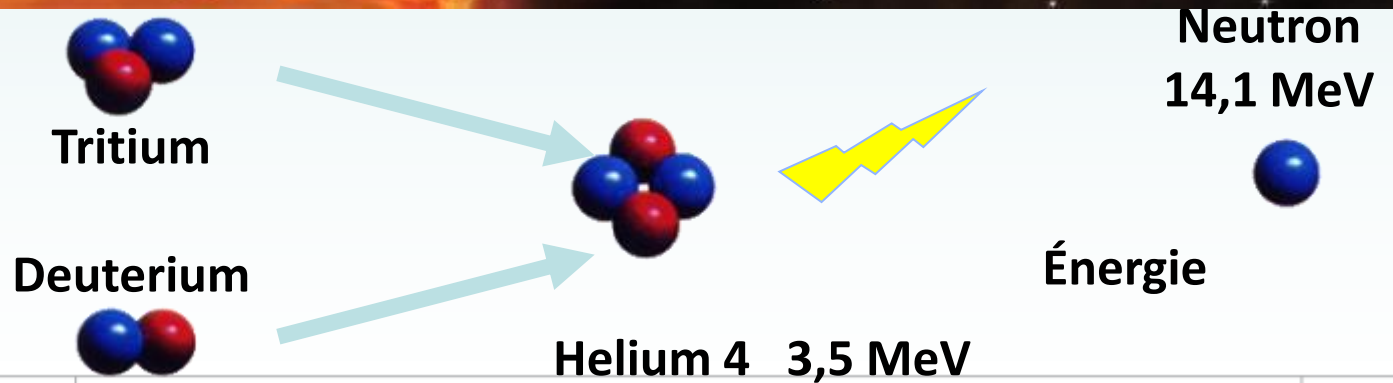


# Fission vs fusion

## Fission

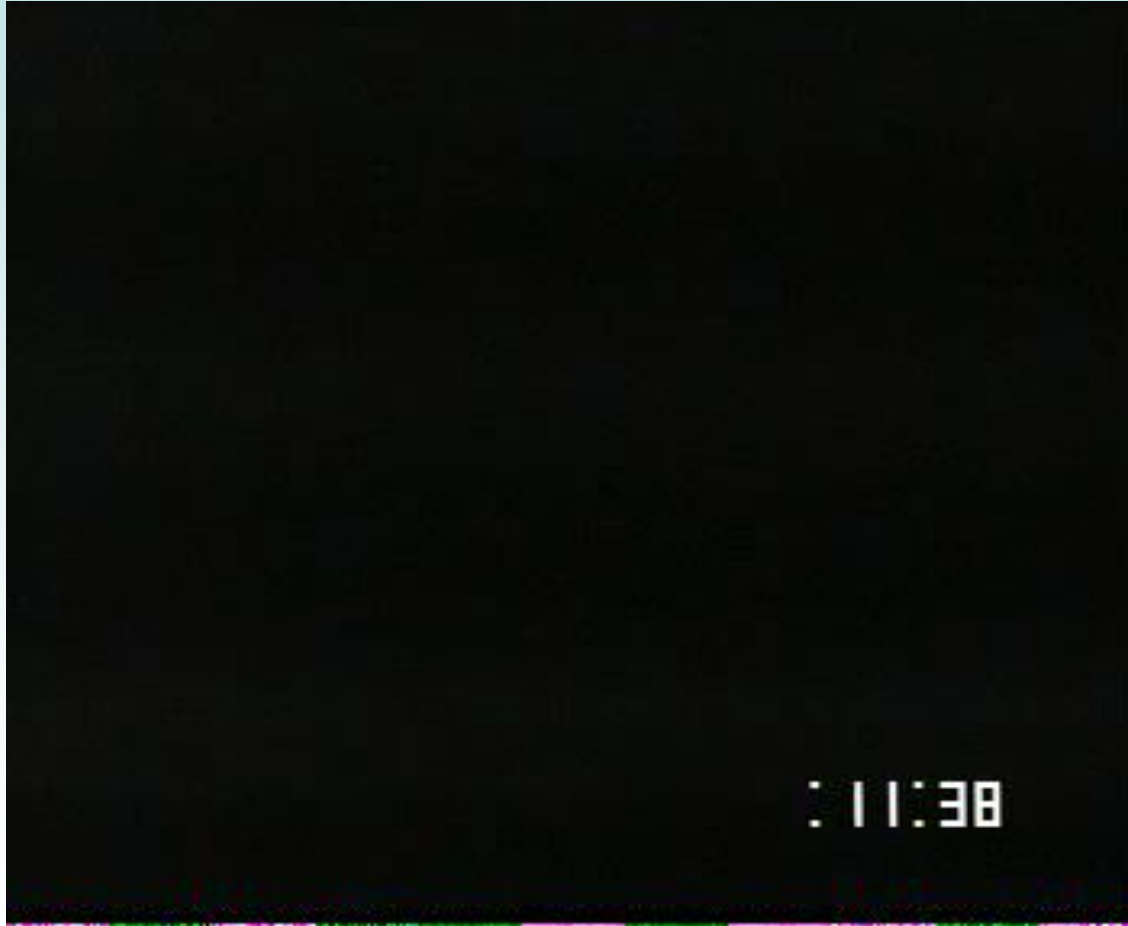


## Fusion



# A plasma in Cadarache

World record obtained by Tore Supra (Euratom-CEA):  
plasma duration of 6 min. 30 sec. (2003)





# Project schedule

Approved by ITER Council in July 2010



**Assembly:** 2014-2018  
**First Plasma:** Nov 2019  
**DT Operations:** 2027



# ITER cost

- « ... after its budget spiralled from £5bn to £15bn”
- « ... ITER a vu son budget exploser »

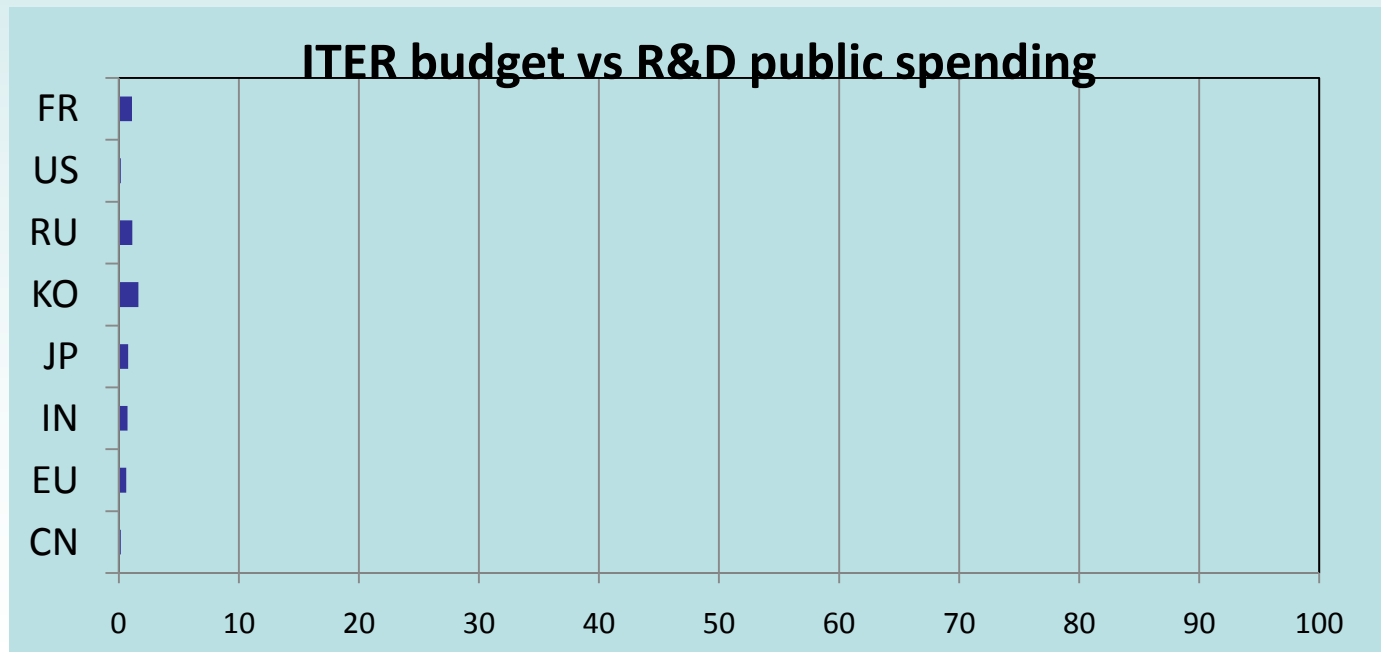
| Construction cost | Occurrences (%) |
|-------------------|-----------------|
| 20 billion        | 10              |
| 15 billion        | 45              |
| 13 billion        | 25              |
| 12.8 billion      | 15              |
| 10 billion        | 5               |



« The cost is estimated today at EUR 12.9 billion according to ITER Organization » (Le Parisien, 18 November 2011) »

# ITER cost

- France's financial contributions in CERN and ITER are about the same
- ISS's budget ~ \$ 100 billion



# ITER communication issues

- ITER is neither a science project nor a technology one
- ITER is a project issued from politics
- ITER is a long-term project, therefore of little interest for politicians

Geneva Superpower Summit on  
November 21, 1985,

Russian Premier Mikhail Gorbachev  
and the US-President Ronald  
Reagan



**"All the News That's Fit to Print"**

## The New York Times

Late Edition  
Weather: Fair likely today, strong easterly winds; rain ending late tonight. Partly cloudy and warmer tomorrow. Temperatures today 41-47; tonight 40-45; yesterday 38-62. Details, page C10.

VOL. CXXXV, No. 46,601 Copyright © 1985 The New York Times NEW YORK, FRIDAY, NOVEMBER 22, 1985

### Text of the Joint U.S.-Soviet Statement: 'Greater Understanding Achieved'

#### Fusion Research

The two leaders emphasized the potential importance of the work aimed at utilizing controlled thermonuclear fusion for peaceful purposes and, in this connection, advocated the widest practicable development of international cooperation in obtaining this source of energy, which is essentially inexhaustible, for the benefit for all mankind.

The two leaders also noted with satisfaction that, in cooperation with the Government of Japan, the United States and the Soviet Union have agreed to a set of measures to promote safety on air routes in the North Pacific and have worked out steps to implement them.

**Civil Aviation Consulates**

They acknowledged that the Soviet Union have begun negotiations aimed at resumption of air services. The two leaders expressed their desire to reach a mutually beneficial agreement at an early date. In this regard, an agreement was reached on the simultaneous opening of consulates general in New York and Kiev.

**Environmental Protection**

Both sides agreed to contribute to the preservation of the environment

ministries and departments in such fields as agriculture, housing and protection of the environment have been useful.

Recognizing that exchanges of views on regional issues on the expert level have proven useful, they agreed to continue such exchanges on a regular basis.

The sides intend to expand the programs of bilateral cultural, educational and scientific technical exchanges, and also in developing trade and economic ties. The President of the United States and the General Secretary of the Central Committee of the C.P.S.U. attended the signing of the Agreement on Contacts and Exchanges in Scientific, Educational and Cultural Fields.

They agreed on the importance of resolving humanitarian cases in the spirit of cooperation.

They believe that there should be greater understanding among our peoples and that to this end they will encourage greater travel and people-to-people contact.

**Northern Pacific Air Safety**

The two leaders also noted with satisfaction that, in cooperation with the Government of Japan, the United States and the Soviet Union have agreed to a set of measures to promote safety on air routes in the North Pacific and have worked out steps to implement them.

**Civil Aviation Consulates**

They acknowledged that the Soviet Union have begun negotiations aimed at resumption of air services. The two leaders expressed their desire to reach a mutually beneficial agreement at an early date. In this regard, an agreement was reached on the simultaneous opening of consulates general in New York and Kiev.

**Environmental Protection**

Both sides agreed to contribute to the preservation of the environment

— a global task — through joint research and practical measures. In accordance with the existing U.S.-Soviet agreement in this area, consultations will be held next year in Moscow and Washington on specific programs of cooperation.

**Exchange Initiatives**

The two leaders agreed on the utility of broadening exchanges and contacts including some of their new forms in a number of scientific, educational, medical and sports fields (inter alia, cooperation in the development of educational exchanges and software for elementary and secondary school instruction, measures to promote Russian language studies in the United States and English language studies in the U.S.S.R., the summer exchange of professors, culture and economics at the relevant departments of Soviet and American institutions of higher education, mutual allocation of scholarships for the best students in the natural sciences, technology, social sciences and humanities for the period of an academic year; holding regular meets in various sports and increased television coverage of sports events). The two sides agreed to resume cooperation in conducting cancer research.

The relevant agencies in each of the countries are being instructed to develop specific programs for these exchanges. The resulting programs will be reviewed by the leaders at their next meeting.

**Fusion Research**

The two leaders emphasized the potential importance of the work aimed at utilizing controlled thermonuclear fusion for peaceful purposes and, in this connection, advocated the widest practicable development of international cooperation in obtaining this source of energy, which is essentially inexhaustible, for the benefit for all mankind.



# Disruptions

- *A disruption is an instability that may develop within the tokamak plasma. It results in a highly intense electrical discharge towards the wall of the confinement vessel with a risk of damaging it*
- “What happens if you put too much energy into a material too quickly? It blows up. [...] We conclude that fusion and magnetic confinement have in no way whatsoever been mastered by its theorists.” Jean-Pierre Petit, CNRS, in “*ITER: Chronicle of an Inevitable Failure*”
- «... *ITER est d'un coût incontrôlable et à terme extrêmement dangereux* ». Title is: « *ITER est incontrôlable et extrêmement dangereux* »

# Tritium

Nobel Prize of physics 2002, Masatoshi Koshihara:

- “ITER, which burns tritium, is extremely dangerous from the point of view of the safety and the contamination of the environment”
- “Tritium is highly toxic with a lethal dose of 1 mg. About 2 kg of tritium that circulates in ITER could kill 2 million people.”

Jean-Marc Levy-Leblond, French physicist and author: “Quite a number of scientists are, from an ideological point of view, against science”

# Can science be transparent?

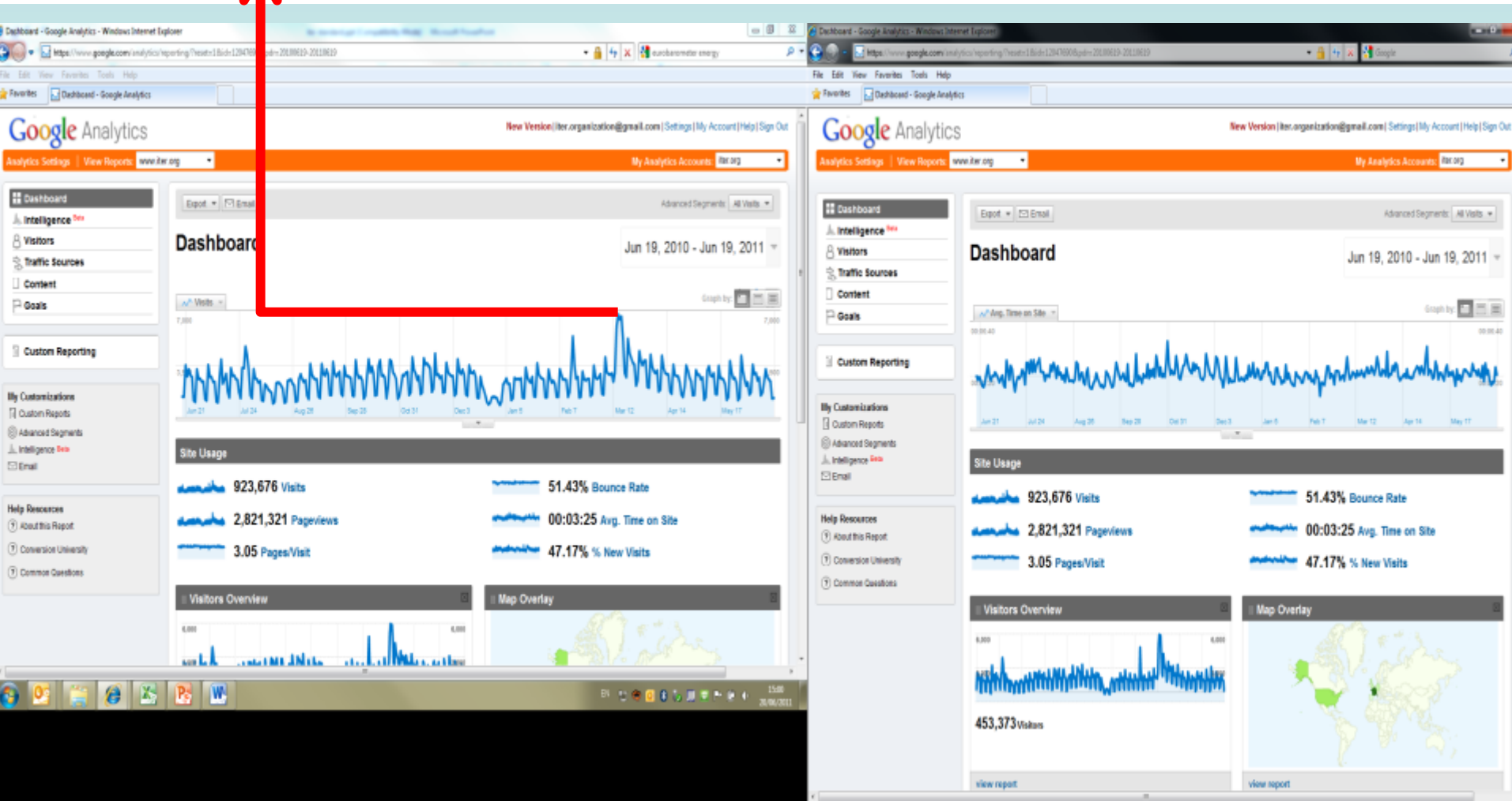




# Public web site

**Fukushima**

On average 3,000 unique visitors per day



# Communicating by numbers...

| 13 billion euros    | Estimated construction cost  |
|---------------------|--|
| 150 million degrees | Plasma temperature   |
| 4 kg of tritium     | Fusion fuel  |
| 23,000 tons         | Weight of the ITER tokamak   |
| 360,000 tons        | Tokamak complex, 50x the Eiffel Tower 's weight  |
| 104 kilometres      | Special 'ITER' Itinerary (200 exceptional convoys)   |
| 80,000 kilometres   | Length of niobium-tin (Nb <sub>3</sub> Sn) superconducting strands for ITER's toroidal field magnets |
| 5,000 workers       | Expected workforce on the ITER site in 2014-2015   |
| 500 MW              | Output power for 50 MW of input power  |

# ...and pictures

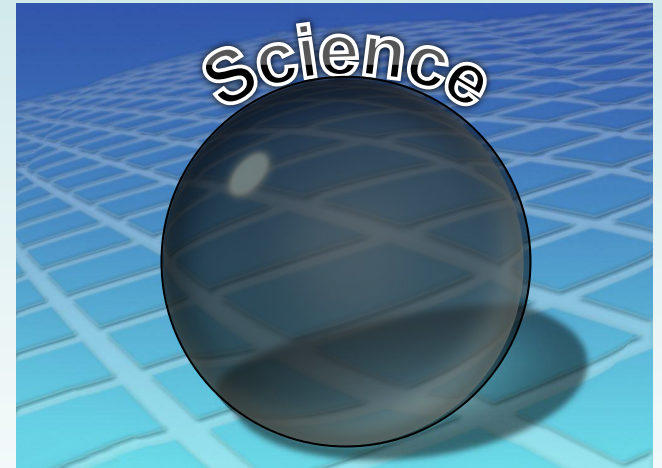




# From science to 'mediascience'

## Science can't be fully transparent

- Forget about the science
- Science journalism under pressure
- Scientific lobbies, science journals = news agencies
- Only 'published' science
- How scientific is scientific communication?



# From science to 'mediascience'

- There are almost never any scientists on air
- The evidence is not an evidence
- Science is built on debate and conflict – but all this is hidden

Still...

- Science needs more mediascience (contextualisation of research)
- Scientific vs journalistic method
- The maturity of an organisation can be judged by its reaction to media reports



**Can science be transparent?**  
(The 'Naked Scientists', BBC)

# Thank you for your attention!



Michel Claessens  
ITER Organization  
[michel.claessens@iter.org](mailto:michel.claessens@iter.org)  
+33 6 14 16 41 75