EUROPEAN COMMISSION

Community research

Mobility for staff in the European fusion energy research programme

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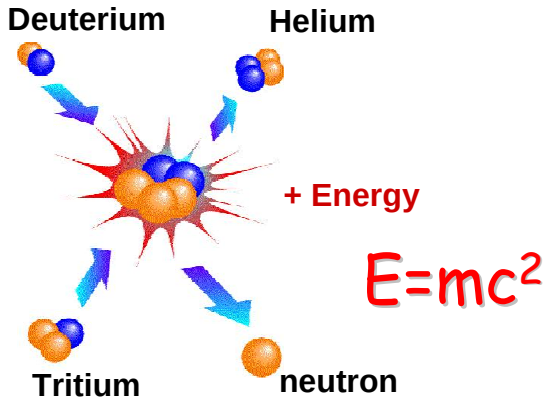
EURATOM

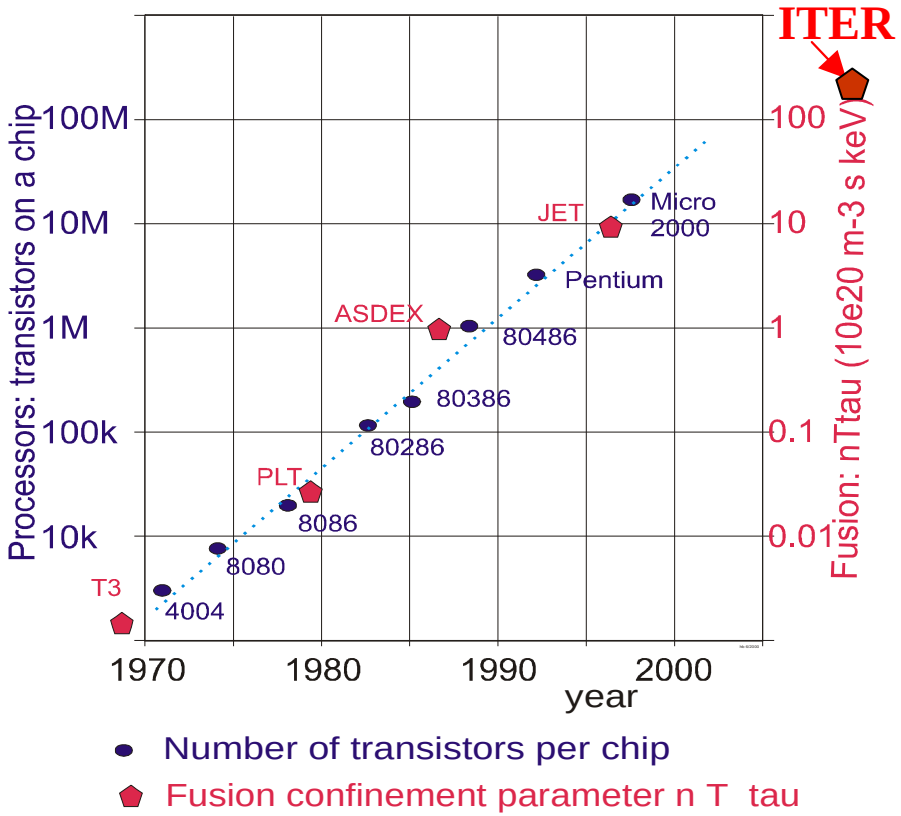
Outline



- A little background: fusion is different to the other research programmes funded by the Commission
- The two fusion mobility schemes:
  - Secondments under EFDA
  - The Mobility Agreement
- Some illustrative numbers

Fusion research – where are we going?

Moore's Law vs. progress in fusion research



Council Decision on Euratom-FP7

"Developing the knowledge base for, and realising ITER as the major step towards, the creation of prototype reactors for power stations which are safe, sustainable, environmentally responsible, and economically viable"

Fusion research – what are we doing?

- ITER is the next major step on the way to fusion power. It is being constructed in a 7-member international partnership at Cadarache, France. **ITER is not involved in the mobility issues discussed here.**
- In parallel to ITER construction there is a strong **European** fusion energy research programme:
  - 26 Fusion "Associations" (research organisations participating in the programme) in all EU Member States
  - The Joint European Torus (JET), currently the world's largest and highest performance fusion device.
- The programme is fully integrated at the European level, with:
  - extensive bi-lateral **collaborations**,
  - overall **co-ordination** of many activities,
  - large, collectively run **joint projects** (in particular, JET)

➔ **The need for researcher mobility**

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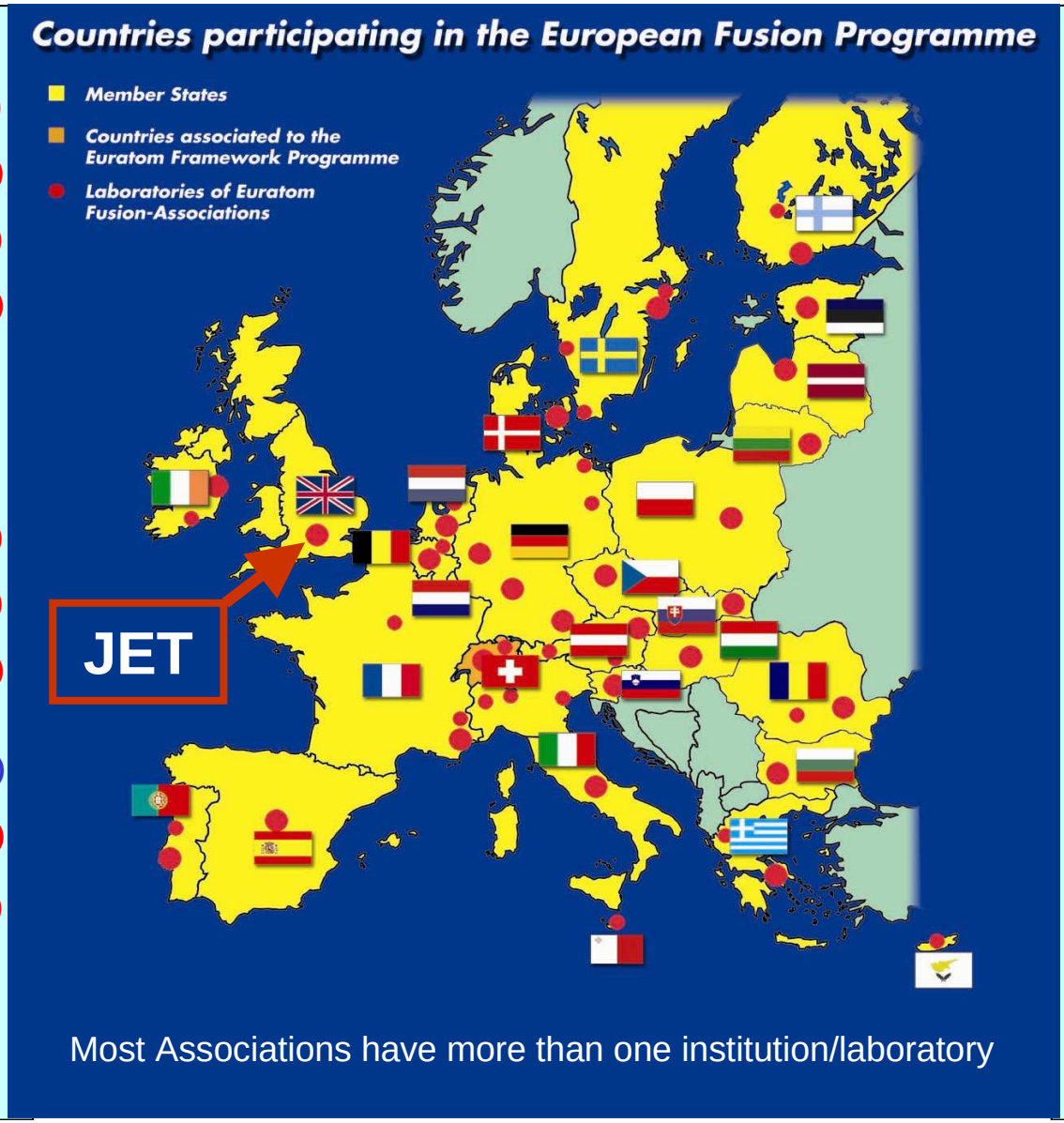
Distributed R&D: 26 Associations in an Integrated Programme

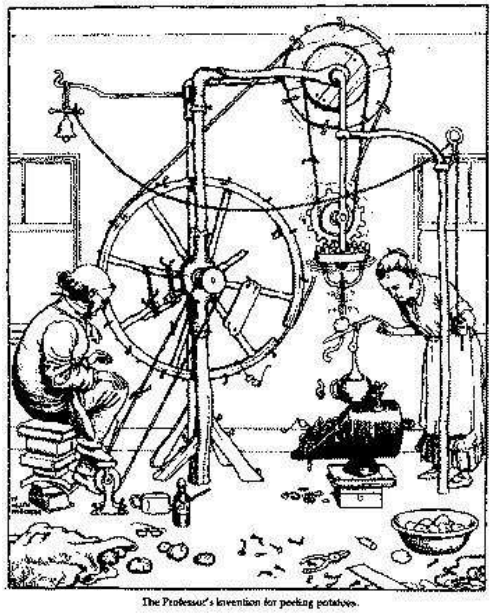
- **Euratom - CEA** (1958) France
- **Euratom – ENEA** (1960) Italy (incl. Malta)
- **Euratom - IPP** (1961) Germany
- **Euratom - FOM** (1962) The Netherlands
- **Euratom - FZJ** (1962) Germany
- **Euratom - Belgian State** Belgium (1969) (incl. Luxembourg)
- **Euratom - RISØ** (1973) Denmark
- **Euratom – UKAEA** (1973) United Kingdom
- **Euratom - VR** (1976) Sweden
- **Euratom - Conf. Suisse** Switzerland (1979)
- **Euratom - FZK** (1982) Germany
- **Euratom –CIEMAT** (1986) Spain
- **Euratom – IST** (1990) Portugal



Most Associations have more than one institution/laboratory

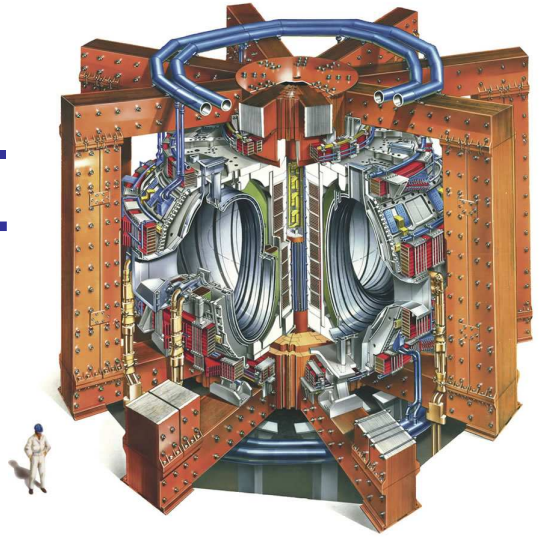
- **Euratom - TEKES** (1995) Finland (incl. Estonia)
- **Euratom - DCU** (1996) Ireland
- **Euratom - ÖAW** (1996) Austria
- **Eur - Hellenic Rep** (1999) Greece (incl. Cyprus)
- **Euratom - IPP.CR** (1999) Czech Rep.
- **Euratom - HAS** (1999) Hungary
- **Euratom – MEdC** (1999) Romania
- **Euratom – Univ. Latvia** Latvia (2002)
- **Euratom - IPPLM** (2005) Poland
- **Euratom - MHEST** (2005) Slovenia
- **Euratom – CU** (2007) Slovakia
- **Euratom – INRNE** (2007) Bulgaria
- **Euratom – LEI** (2007) Lithuania

EU Fusion research – the fusion Associations



- The Contract of Association is the way that long term continuity of the research is ensured
- The Associations carry out the research
- The Associations are the owners and users of the research facilities
- The Associations are the reservoir of scientific and technical expertise in the programme – about **2500 professionals**
- An **extensive network of collaborations** between the Associations (eg researchers from small Associations participating in the experiments on large devices in another Association)

EU Fusion research – JET



- The world's largest and highest performance fusion device
- The only fusion experiment presently able to operate with the fusion fuels deuterium and tritium
- Scientific exploitation is a **collective effort** by all the fusion Associations, **coordinated by a small team** brought together under the European Fusion Development Agreement (EFDA)
- The operation of JET (typically 120-150 days per year) requires **about 80-100 researchers** on site at the same time, from a pool of about 320
- Planning of experiments and later analysis of results involves all these researchers, and more

Provisions for staff mobility in the fusion programme

The programme has two schemes for financial support to the mobility of **researchers employed in the fusion laboratories:**

Secondments under EFDA* (mostly for JET)	**The Mobility Agreement** (between labs., and to JET)
individuals proposed/selected to provide necessary skills	each lab. makes an annual plan to cover its collaborations
generally longer stays	generally shorter stays
flexible within limits	flexible with respect to dates and duration of visits
the Commission deals with individuals and their employers	the Commission deals only with the employing institution

* The European Fusion Development Agreement

Secondments under EFDA

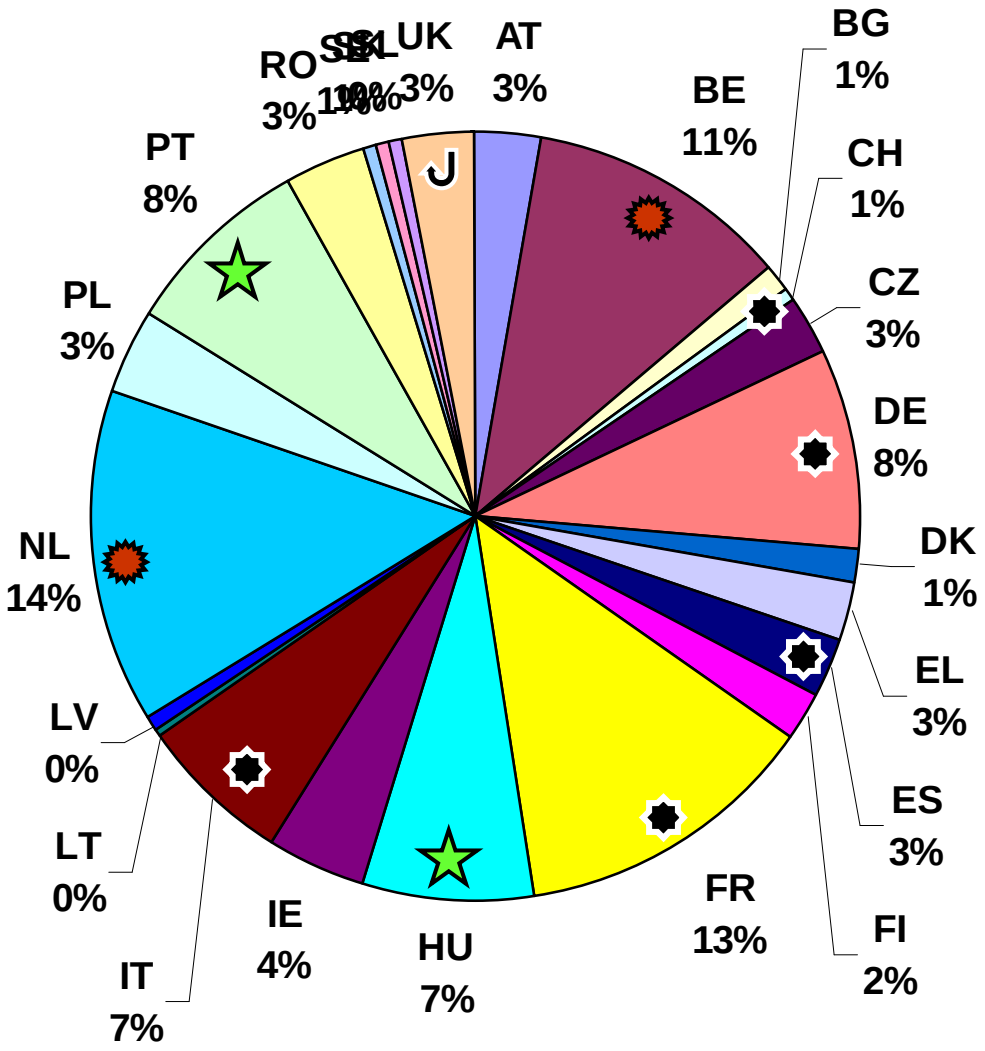
- A small core team at JET of about 30 professionals, generally for ≥1 year (the selection process is organised by the team Leader)
- Other individuals with specialised skills are selected by mutual agreement between the sending and receiving organisation
- The total is about 54 PPY, made up of 94 assignments (2008 data)
- Assignments are generally ≥4 weeks, ≤up to 4 years, recall by home laboratory up to 10 days per year
- Financed from the Euratom fusion budget (Framework Programme):
  - A secondment allowance paid to the individuals (basic plus an allowance for dependents, removal expenses and home travel)
  - Salary and mission costs for the core team reimbursed to the employer
- An **essential tool** to support the collective exploitation of JET

The Mobility Agreement

- Missions are mostly for doing research, but also certain meetings (planning or analysing coordinated activities, international cooperations). Conferences are always excluded!
- Each laboratory prepares an annual mobility plan (labs. to visit, estimate of number of people and duration of visits, budget), which is easily revised
- These missions are mutually agreed by the laboratories concerned
- In 2008: 134 PPY of missions, for a total of 823 researchers
- Financed from the Euratom fusion budget (Framework Programme):
  - Subsistence paid according to employer rules (up to €150 per day), travel paid for missions >28 days or outside the EU,
  - The Commission monitors the execution of the mobility plan and reimburses the employer once per year up to a budget ceiling
- As **flexible** and as **simple** as possible to administer

Use of mobility - by country

Percentage of the total 134 PPY (2008)



J The UK is host to JET

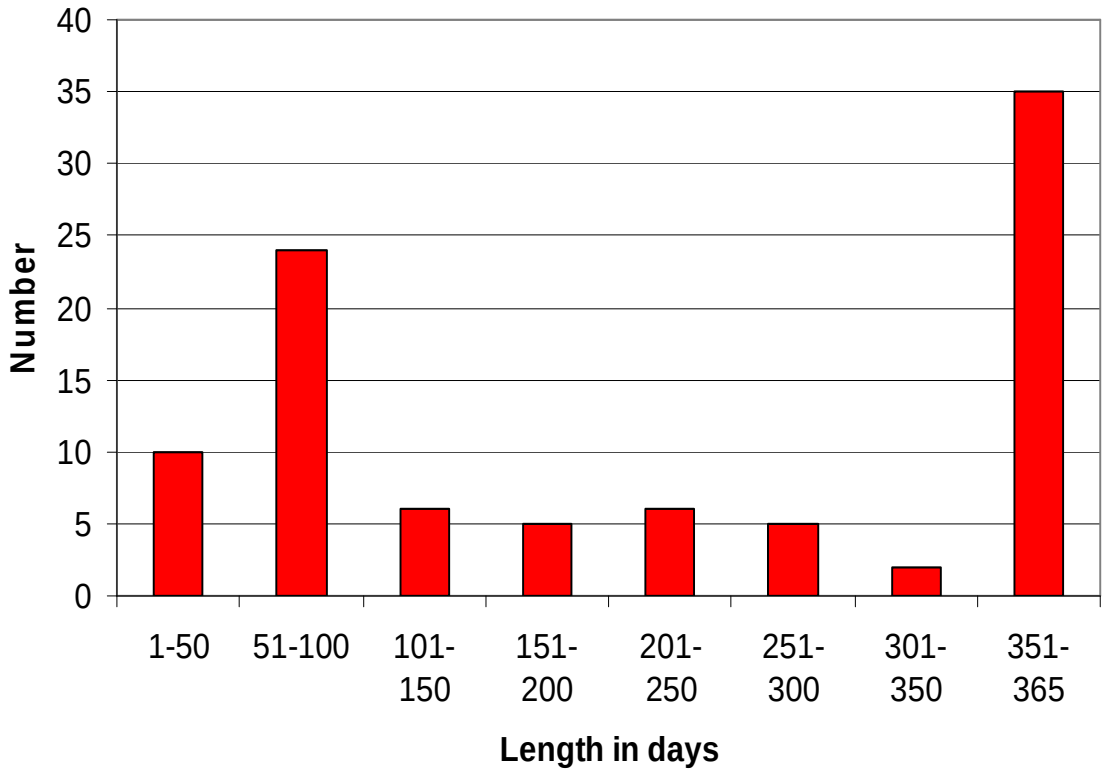
CH, DE, ES, FR and IT have large experimental facilities

BE and NL are in a "cluster" with the FZJ laboratory (DE) to exploit its facility

HU and PT are small players, but have a policy to do almost all their research within collaborations

Secondments (mainly to JET)

Duration of secondments (2008)
54 PPY in total



- A total of about 94 secondments signed during the year
- Some are extensions from previous years (ie duration >365 days)
- Shorter secondments usually for a particular JET experimental campaign

Fusion publications from Portuguese laboratories in 2008

Portuguese staff* are:	Journal publications	Presentations to international conferences
Not named, part of a large team	52**	9
Named, together with other authors	28	39
The only authors	11	25***

All these numbers are approximate!

* There are about 65 full time equivalent researchers working on magnetic confinement fusion

** Mainly publications from JET with a large number of authors

*** Includes a number of invited talks

Fusion publications from IPP* in 2008

* The Max-Planck Institute for Plasma Physics, Garching & Greifswald DE

IPP staff* are:	Journal publications	Presentations to international conferences
Not named, part of a large team	0**	0**
Named, together with other authors	244	85
The only authors	114	30

All these numbers are approximate!

* There are about 450 full time equivalent researchers working on magnetic confinement fusion

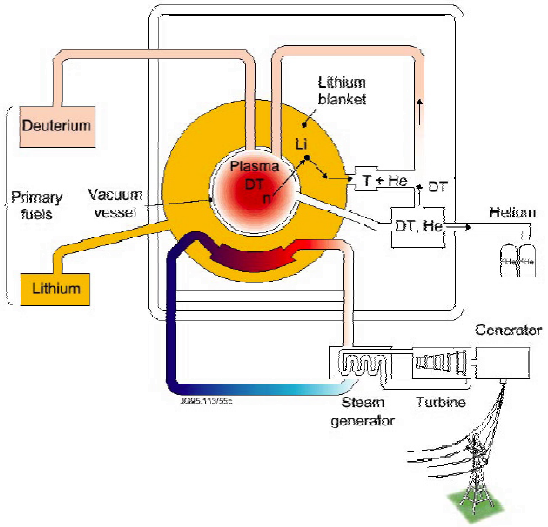
** Possibly due to the way the publications are reported

Fusion publications from JET

In a typical year of full operation:

	Journal publications	Presentations to the two major international conferences
Collective authorship ("JET-EFDA Contributors")	~70	~100

Summary



- The European fusion programme:
  - includes a large number of laboratories,
  - involves a large number of researchers,
  - has a single overall aim,
  - has both collaborations and collective actions
- Two mobility schemes, *(over-)simplified*:
  - individuals with particular skills for JET,
  - a tool for the Commission and the laboratories to manage collaborations
- **Mobility is an essential component of the “glue” which holds the integrated programme together!**