

# JET Insight

Quarterly News & Views of Europe's largest Fusion Device



July 2008



EFDA Associate Leader for JET, Francesco Romanelli, cuts the commemorative cake in the presence of the former directors. Left to Right: Jérôme Paméla, Martin Keilhacker, Gisela Wüster (widow of first director Hans Otto Wüster), Francesco Romanelli and Paul-Henri Rebut.

## Dear Reader

The first edition of the newly designed successor to the "EFDA-JET Bulletin" is dedicated to a special occasion: the 25<sup>th</sup> Anniversary of JET's first plasma.

The continuous success of the JET Experiment since its first plasma on 25 June 1983 has made it possible, 25 years later, to look back at that very exciting beginning and the subsequent milestones set by JET in International Fusion Research.

Together with many of those who contributed to JET's coming to life, and various other JET contributors including former directors it has been a great delight to share the satisfactory feeling of taking part in a European success story.

JET has fulfilled all its original objectives and this is clearly illustrated by its numerous achievements since day-one. However, I am more than happy to say that JET can deliver more, especially in view of ITER. This is the reason why JET is now on the threshold of completing a substantial upgrade and preparing for experiments which should deliver answers to urgent ITER-relevant questions.

JET should then be in the position to demonstrate the controlled release of fusion power production.

*“ I am confident that the intellectual diversity and richness that JET is benefiting from will help continuing the success story. ”*

This will be possible with parameters and within an environment closest to ITER conditions. The full exploitation of these capabilities requires the extension of JET operation until 2014.

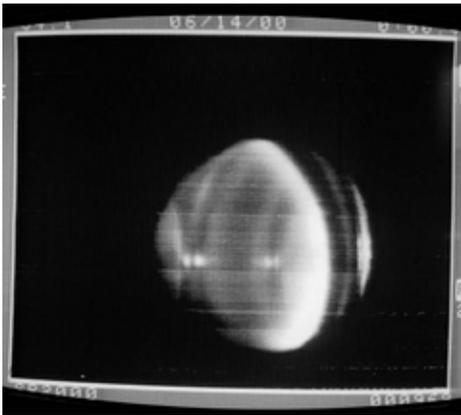
I am confident that the intellectual diversity and richness from which this European experiment is benefiting will help to continue the success story and provide a testbed for the culture of international collaboration upon which the success of ITER entirely relies.

Yours sincerely,

  
Francesco Romanelli

Reflections, and outlooks, many conversations between people who have known each other for 20 or more years. Among them young scientists just starting their career: that was the celebration of the 25<sup>th</sup> anniversary of JET's first plasma.

# Look back in **delight**



*First Plasma in JET*

The 25<sup>th</sup> Anniversary celebration on that sunny day brought together over 130 people with diverse backgrounds and ages: engineers, physicists, students, postgraduates, retired staff, and three of the five directors, all of whom had made Europe's largest fusion device such a successful world-class experiment.

After lunch, former Director Paul-Henri Rebut reflected on the design and realisation of the machine which, in his own words, were guided by two core principles: "simplicity and sturdiness". These features made JET, right from the start, flexible and able to evolve its hardware with the changing requirements imposed by the new areas of physics and technology investigations. Rebut's lively talk enlightened much on what happened the first day of JET operation. Afterwards, the current director, Francesco Romanelli, in his talk focused on the future of JET and pointed out Europe continues to invest into the machine.

## A promising start

The 25 June 1983 was an exciting day for all of those involved. It became even more so since the press were also present: journalists were invited to experience the very first steps in the coming to life of the experiment. It was already a large success. The preceding five years of construction had made it possible for the JET Team to start, on that day full of suspense and expectation, the process which opened the way for a string of achievements and enhancements. Two examples illustrate the milestones set by JET in International Fusion Research. Firstly in 1991 the first ever controlled release of fusion power, using deuterium-tritium as a fuel mixture took place in a tokamak. Secondly nearly two million watts of fusion power were produced. Six years later the world record in fusion power production was set when 16 million watts were produced.

## JET – an Investment for ITER

JET main assets include its large size, its magnetic configuration similar to ITER, its beryllium, tritium and remote handling capabilities. These features make JET the machine closest to ITER.

Today, JET continues to play a major role in supporting ITER construction and operation. JET will test the same combination of materials for plasma facing components as in ITER, thereby providing valuable operational experience.

Therefore, investing in JET today in making and as close as possible to ITER clearly represents future savings on ITER operational costs and time.

*Richard Kamendje & Petra Nieckchen*



*Day-one: (Left to Right) the second director of JET, Paul-Henri Rebut and his predecessor Hans-Otto Wüster.*

## A brief JET history

- 1983 Operation starts, 3 million amps achieved
- 1986 Plasma temperatures exceed 100 million degrees with a new heating system
- 1988 Plasma current of 7 million amps achieved
- 1991 First controlled release of fusion power
- 1997 World Record of 16 million watts of fusion power
- 2000 JET starts under EFDA and validates ITER reference operation
- 2002 Divertor discharge lasts a record 50 seconds
- 2003 Trace tritium experiments
- 2006 JET starts experiments ITER-like magnetic configuration
- 2008 First experiments with ITER-like Ion Cyclotron Resonance Heating antenna



People from day-one carefully listen to the future plans of JET. Front row, left to right: Michael Watkins, Gisela Wüster and Paul-Henri Rebut.



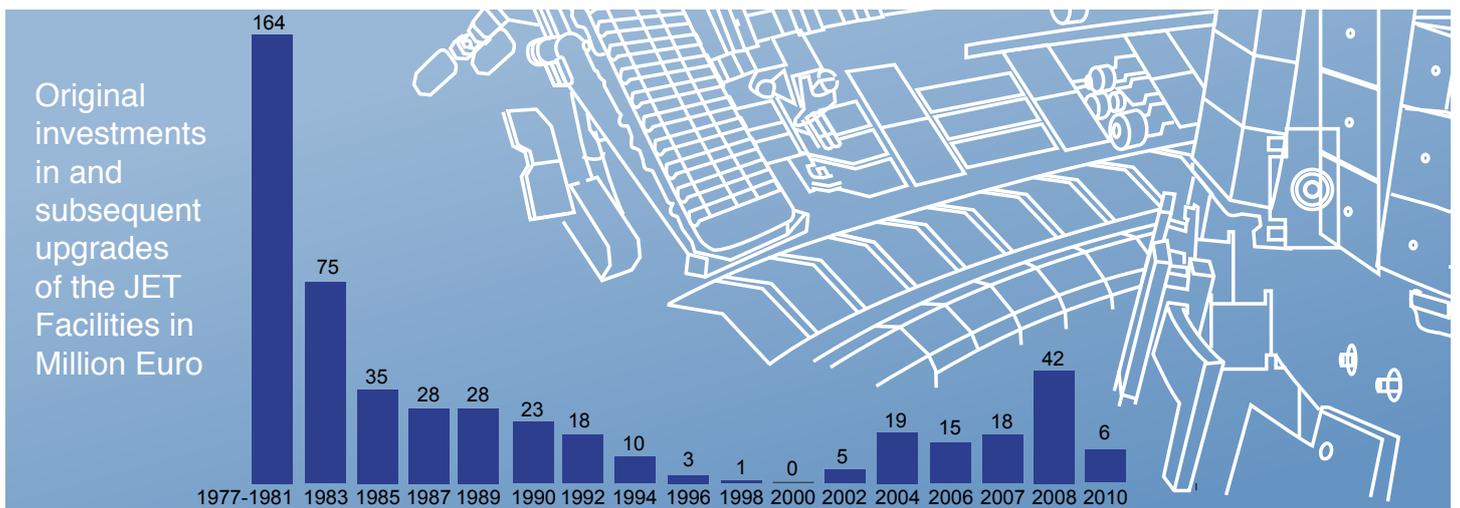
Witness to day-one: David Smart now aged 91 responded to the invitation and followed the talks with interest and concentration.



The lunch gave much time to discuss current and future science on JET.



Francesco Romanelli focused his talk on the future of JET and presented a plan for machine exploitation up to 2014.



# Young scientists at the anniversary



*"I think the international aspect of the experiment. The fact that it is really a centre of excellence where people from all around the world come to execute experiments. I enjoy also the possibility to collaborate on modelling and theoretical activities."*

**Wojtek Fundamenski Poland**



*"In particular, the weekends since then I can work without a lot of interruptions."*

**Thomas Eich Germany**



*"Two parts. One part I enjoy a lot the scientific work because it is very interesting to work here. And the other also very nice part is that it is an international environment and you get to meet a lot of people from all over Europe."*

**Krystel Crombe Belgium**



*"I have worked on smaller laboratories in Europe, which is fun – you had the Plasma physics. But working on JET really brings together the whole of Europe which I find very enjoyable. And it brings together all the experts of all of Europe and that makes it very challenging and interesting area to work in."*

**Marc Beurskens Netherlands**



*"I like the variety of my work, working on experiments like the tokamak and also working to develop new diagnostics to go into the Torus. So it's a very good job."*

**Anna Widdowson UK**



*"What I really enjoy is actually the international team we are working in. Having people from all over the world, meeting them daily. That's what I enjoy very much and looking in particular at all the political differences of different sides. It's interesting."*

**Matthias Brix Germany**



*"I think mainly the international ambience. There are so many people from so many backgrounds that still manage to work and collaborate effectively."*

**Janos Marki Hungary**

*"What do you enjoy most working at JET?"*



*"The atmosphere, I guess, its people from different countries. I came here ten years ago when I was a young student, then it felt fantastic. Now I'm sort of getting used to it, so it's not fantastic anymore but it's still pretty great."*

**Tuomas Tala Finland**



*"Here you really apply what you study. When you are in a university or a theoretical research centre, you just read and write papers. When you don't apply things there can be something that is actually wrong. The thing you see in the application suggest you how to make a better theory."*

**Antonio Quercia Italy**



*"I think the most enjoyable is that JET is really a focus point of fusion research in Europe. That you have people from all over the place coming here. So being here gives you access to the most bright people and it is actually pleasant to work together with."*

**Volker Naulin Denmark**

## Imprint

### JET Insight

are published by  
EFDA JET Close Support Unit,  
Culham Science Centre,  
Abingdon, Oxfordshire,  
OX14 3DB, United Kingdom

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