Training activities and dissemination of scientific culture in a national research facility

Synchrotron SOLEIL

Saint-Aubin, France

content

- *SOLEIL activities in training and science culture*
  - *education to science, visits*
  - *short-term trainings*
  - *hosted students and trainees*
  - *courses outside the facility*
- *observations / impact measurement*
- *return of experience*

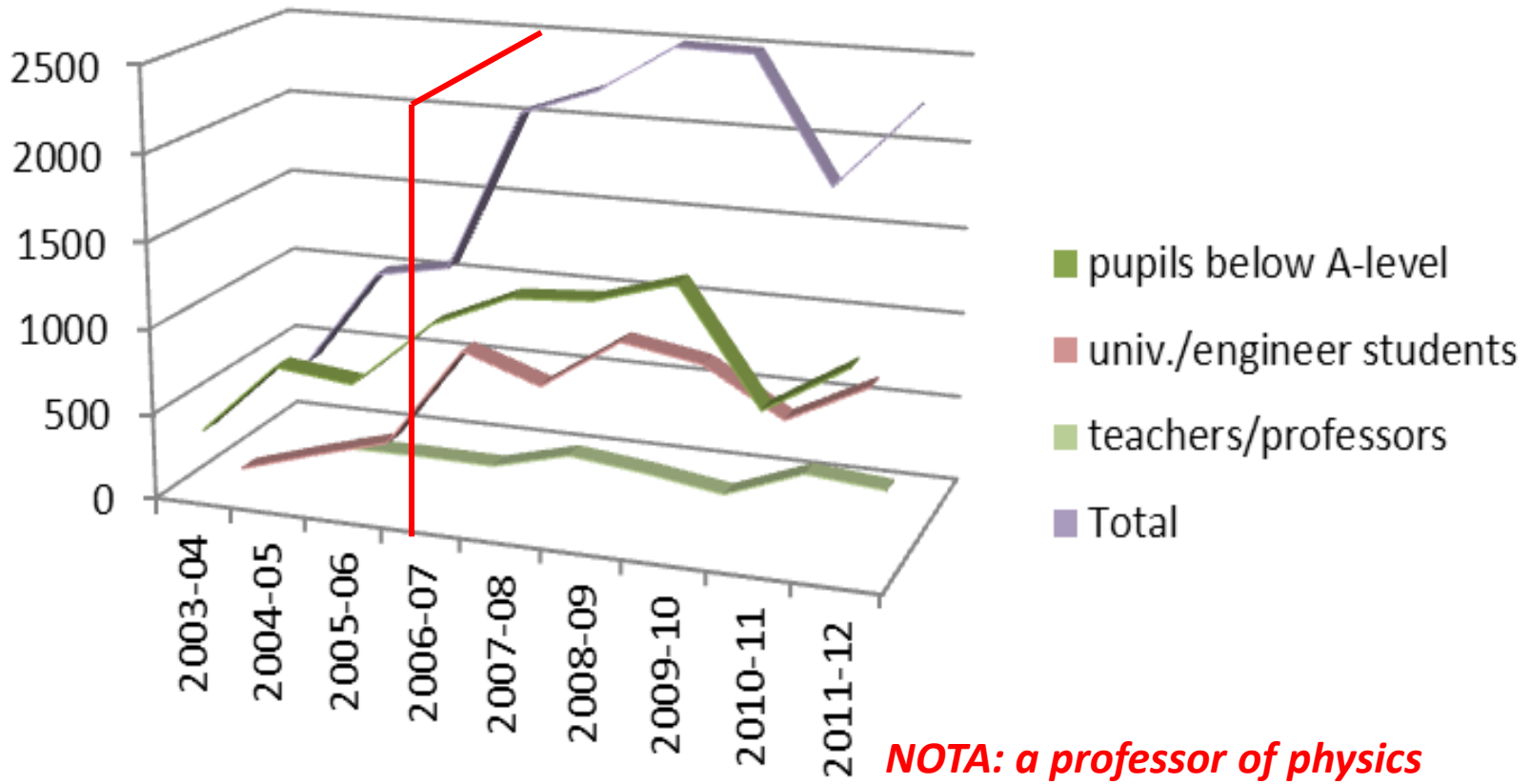
a brief history

- *SOLEIL construction started in 2002 after an heavy political struggle (1997-1999)*
  - *Note: the diffusion of scientific culture as a 'basic' imposed by the region (40% funding)*
- *first electron beam produced in 2006*
- *inauguration by President Chirac in December 2006*
- *first users received in January 2008*
- *operated by 336 permanent staff and ~60 fix-term staff*
- *~1800 users & ~5500 visitors per year (~50% less than 18)*

Public information

- Scientific AND economic activities

Students, pupils and… teachers!



NOTA: a professor of physics is detached at SOLEIL 2days/week by the rectorate (since 2002)

Hand-in-hand with schools

education to science, discovery of research activities, of the researcher's job, « build and test » approach, free pedagogical kits, etc…

Summer schools (~1 week)

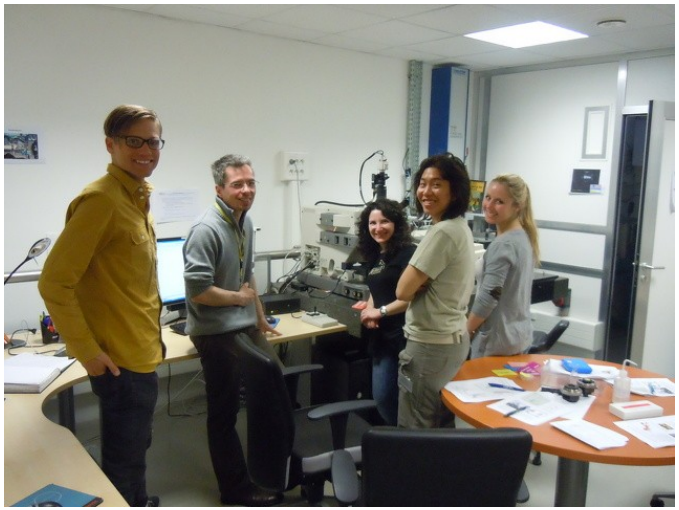
- Hercules (ESRF-ILL): 70 per year
- SOLEMIO (X-ray Microscopy): 30/year
- Cristallography : 25/2 years
- Surface technics : 20/year
- EMBO: 24 attendees (2008)

about 130 weeks
of full time attendee
delivered per year
(students and users)

Hosted students (2011)

- **Short term trainees** (2 to 6 months) : 21
- **PhD** : 29 (17 SOLEIL + 12 another employer)
- **Post-docs**: 22 (full time)
- **Apprenticeship** (sandwich course 1 to 2y) : 10
- **Tutorials and group work** : 3 classes from 2 engineering schools (27 students)
  - Project oriented (design + execution)
  - On-site installation

  (soft or instrumentation) 1 week



Ecole Centrale Paris (2012)

- Joint tutorial program ESRF-SOLEIL-ECP
- 2 real projects: **microscopy beamline + angiography beamline**
- Scientific objective: analysis of the scientific demand
- Engineering objective: techniques to be implemented for realizing the beamlines
- 2 groups are working during 1 week on the facility and later through video-conferences with experts
- Presentation to the experts: design, lay-out, components characteristics, simulations
- Project organisation is a criteria as well
- **Award of marks by experts AND students**

Courses outside the facility

- in 2011, about 1100 students (master of science and engineering high schools) followed a course given by one of the 56 SOLEIL volunteers involved in these training activities
- more than 820 hours of courses have been delivered
- large scope of domains : theory, SR techniques, engineering (vacuum, optics, etc), radioprotection, management
- mainly within fairly close area

(50kms around SOLEIL)

Observations

- large impact in terms of targets; in 2011:
  - ~2500 pupils have been educated to science activities
  - ~1400 students have been trained in SR sciences (on&out-site)
  - ~200 students carried out a project or a tutorial at SOLEIL
  - *deficit of targets over the 3 years of bachelor*
- large variety of teaching methods
- **large involvement of the staff**: about 89 scientists and engineers have been involved in the visits and training activities
- **design of 'buy products'** devoted to the diffusion of scientific culture: pedagogical kits, games, posters, educative prototypes…

Return of experience

- transmission of knowledge means also transmission of values (**“science to citizen” approach**); science culture:
  - help to explain political and scientific choices and their utility for the construction of today and tomorrow society
  - may help scholars to ascertain their vocation for research
- research infrastructures are focal points for putting science back in innovation attitude/culture
  - get in touch with a largest range of students – including professors (schools to universities)
  - ‘tutorials for all’: full development of applied projects as well as possible (from the design to the implementation)

Thank you for your attention !

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