ESRF | The European Synchrotron

Connecting Research Infrastructure with Industry: The Adventures of the ESRF

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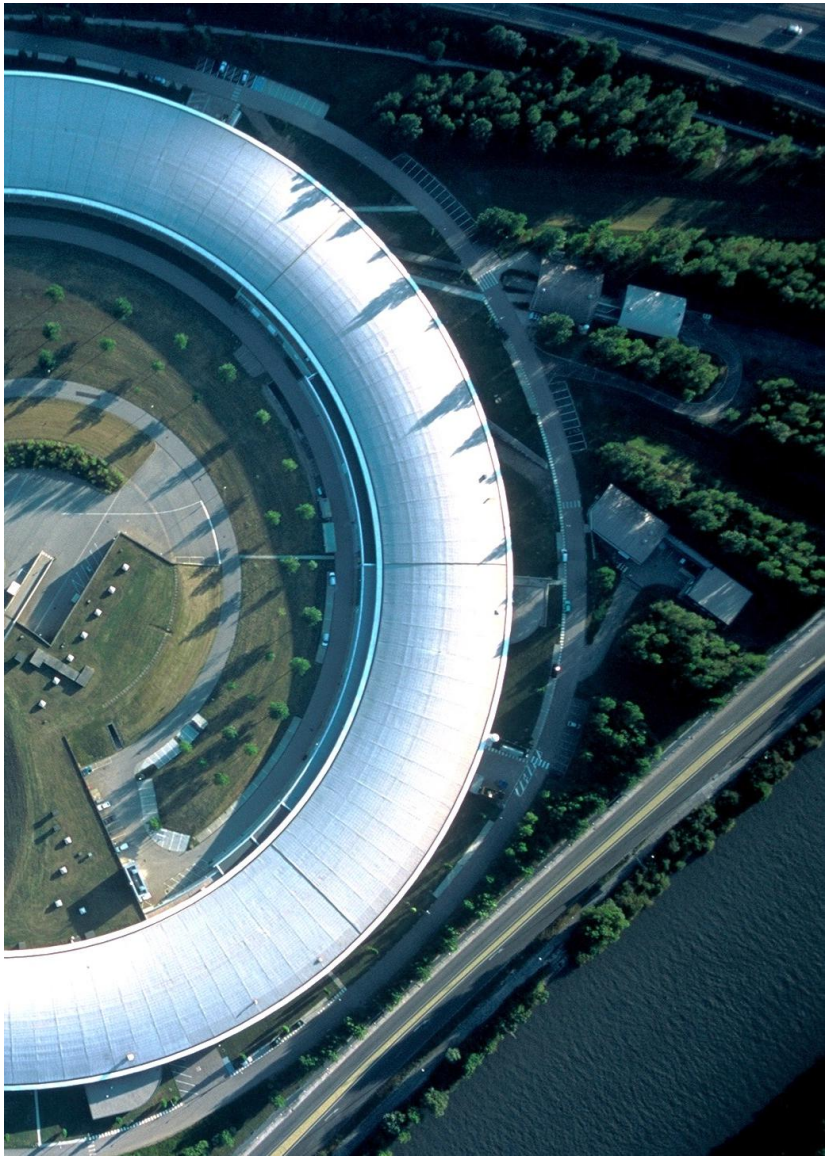
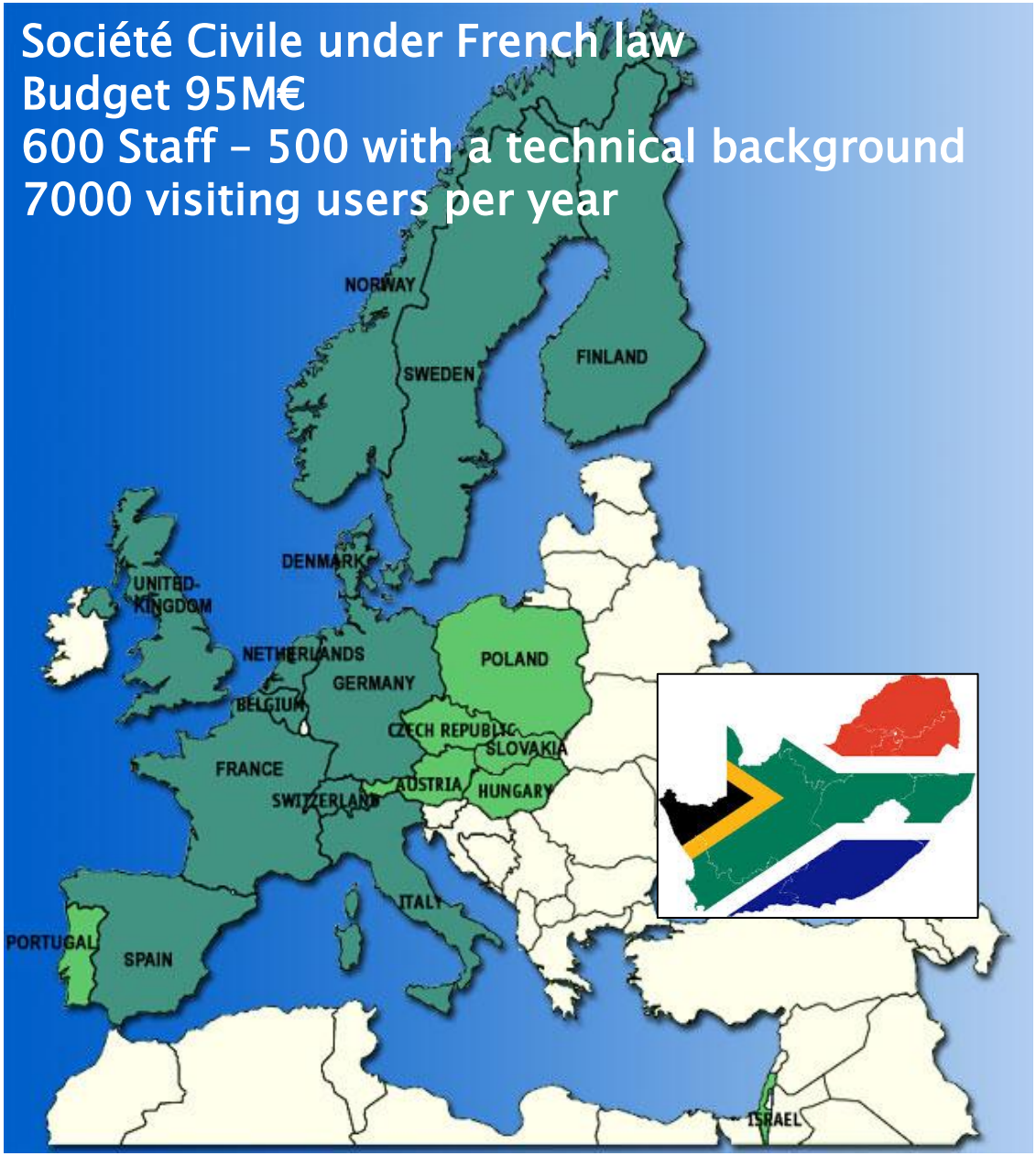


Société Civile under French law
Budget 95M€
600 Staff – 500 with a technical background
7000 visiting users per year



ESRF Member States

France	27.5 %
Germany	25.5 %
Italy	15 %
United Kingdom	14 %
Spain	4 %
Switzerland	4 %
Benesync (Belgium, Netherlands)	6 %
Nordsync (Denmark, Finland, Norway, Sweden)	4 %

ESRF Associates

Portugal	1 %
Israel	1 %
Austria	1 %
Poland	0.6 %
CentralSync (CZ, H, SK)	1.05%

Confidential facility access

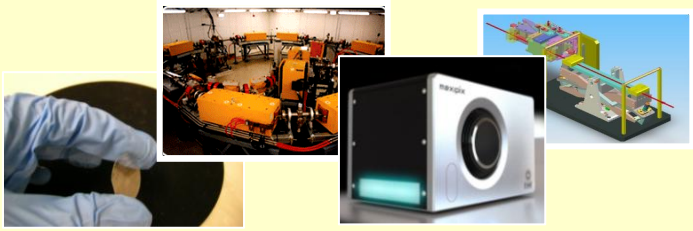
- Generates 1.5-2M€ annually
- 100 unique clients
- On-site, RA, Mail-In

~40% of public beam time science has links to industry

- Industry with academia
- Industry alone!

Instrumentation & technology IP

- 30 technology licences
- Instrumentation expertise



Contract Research & Partnerships

- NANOELEC.
- CRO activity in MX with EMBL
- SaintGobain funded Post-Doc
- GSK-ESRF-ILL trainee
- Horizon2020 partner

Responsible for all ESRF industrial activities

- Industrial access to beamlines, facilities, and expertise
- Technology transfer through licensing, patents, spin-off
- Manufacturing
- European and national funding opportunities

About 5 FTE + other resources as we can obtain

- Call upon Finance, Legal, Admin for support as well as the goodwill of all ESRF staff to work with industry

2 x Structural Biology Industry Scientists
2 x Imaging Industry Scientists
1 x Soft Matter Scientist
1 x Instrumentation Engineer
1 x Administrative Coordinator
1 x Head of Business Development

ArcelorMittal

Bayer HealthCare
Bayer Schering Pharma

Medivir

Schneider
Electric

TOTAL

AREVA

MERCK

Vernalis

astex
therapeutics

ucb

Rhodia

GALDERMA
R & D
SOPHIA ANTIPOLIS
CORNING

novo nordisk

numericalrocks

Groupe
sanofi aventis
L'essentiel c'est la santé.

TOYOTA CENTRAL R&D LABS., INC.

JM
Johnson Matthey

syngenta

NERVIANO MEDICAL SCIENCES

L'ORÉAL
RECHERCHE

gsk
GlaxoSmithKline

Unilever

Sareum

DAIHATSU

AstraZeneca

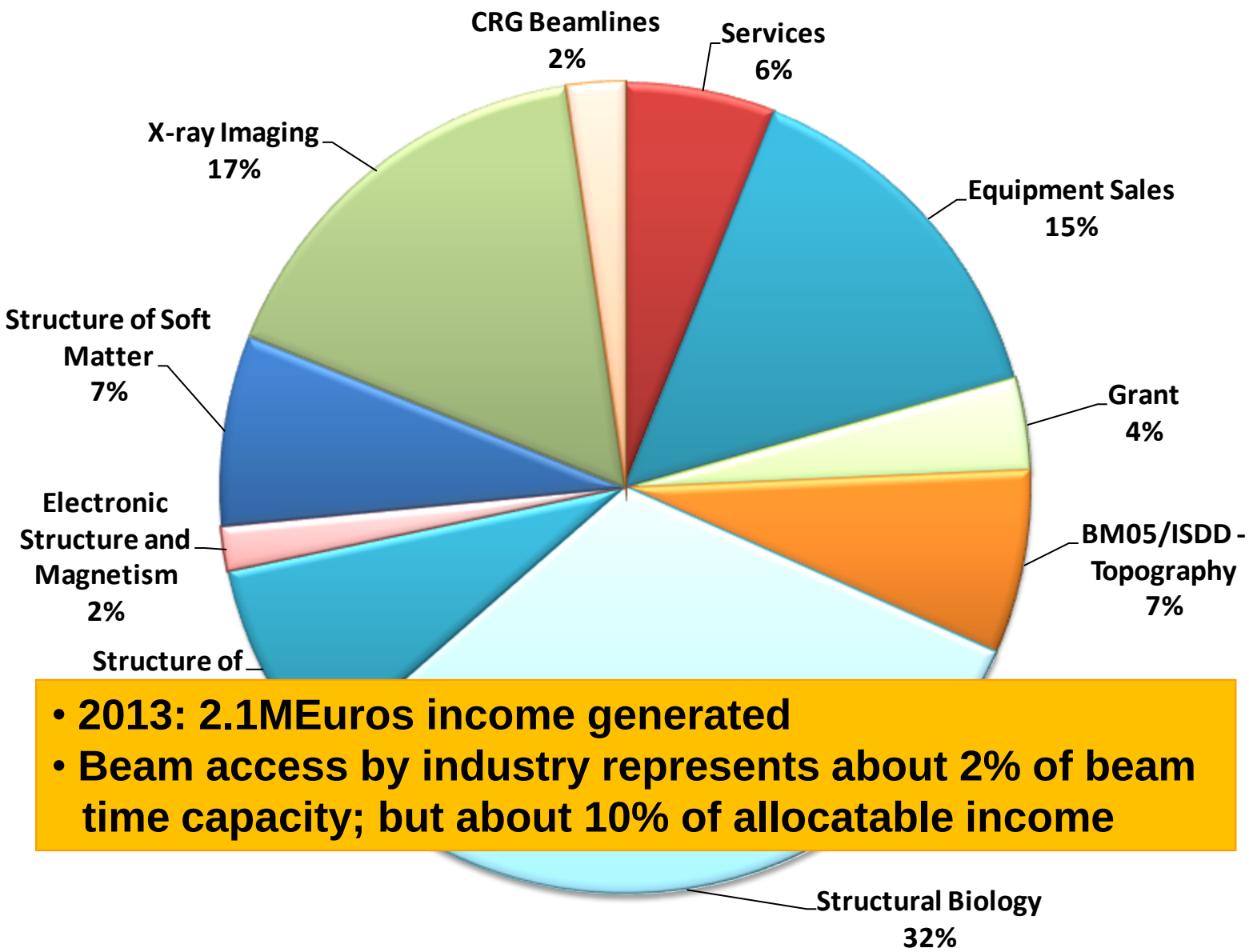
ARIEL
Excel Gel

NEW
MAGNUM
ALMOND

A380
AIRBUS

DURACELL
PLUS

ESRF INDUSTRIAL INCOME



- **2013: 2.1MEuros income generated**
- **Beam access by industry represents about 2% of beam time capacity; but about 10% of allocatable income**

PRICING

1. **Standard per 8 hour shift price of 3,600€**
   - Higher for protein crystallography RA and high-flux facilities
2. **Fixed per sample prices for mail-in protein crystallography, bioSAXS, SAXS, PDF**
   - Rapid access provision
3. **Customised quotes for**
   - Mail-in tomography, powder diffraction, spectroscopy…
   - Contract R&D, including combined facility and partner work

Basic fees include Local Contact set-up and "mentoring".

We add 175€/hour for Scientific Support.

WORKING WITH INDUSTRY: KEY BOTTLENECKS

1. Communication and understanding

- Providing the answers that industry want
- SMEs
- Feasibility studies

2. Resources to work with industry

- Capacity to provide high service level

3. Training/education

- Non-expert awareness, access and use

4. Statutes and working practices set-up for academics

- Slow access
- Staff motivation

5. Standards & certification

- QC, GLP, ISO

European Light Sources for Industrial Innovation "ELSII"

Networking activity of CALIPSO

Led by ESRF

Expectations

1. Practical feedback from Industrial Advisory Board
2. Increased contact between business offices of the light sources
3. Heightened awareness of light sources in industry
4. Study opportunity for co-innovation and road-mapping with industry for detector technologies

X+n: Integrating with NMI3

- A larger and more representational IAB than provided for by CALIPSO funding alone
- IAB with X-ray-neutron “cross-talk”
- A larger set of RI encompassing synchrotron facilities, free-electron lasers, and neutron and muon sources;
- Exchange of know-how, experience and best practice between the X-ray and neutron worlds

Joint ESRF-ILL-EMBL Pharma Workshop: 3-4 June

NEUTRONS FOR SCIENCE®

A light for science ESRF

EMBL

Expert Panel
Neutron & Synchrotron X-rays for Pharmaceutical R&D

Programme 3-4 June 2013

To be followed by the
Partnership for Structural Biology 10th Anniversary Celebrations

way for light calipso

“Problem matching and expertise”

Excelsus
Structural Solutions

Finden

Danmarks Tekniske Universitet DTU

:CR: Colloidal Resource

NOVITOM
ADVANCED 3D MICRO-IMAGING

way for light calipso

The GIANT initiative brings centres of excellence together to create a world-class Innovation Centre

Institut de Recherche Technologique sur la micro et nanoélectronique

IRT NanoElec

A French PPP of c. 450MEuros

Core task: Characterisation Programme

TECHNOLOGY RESEARCH INSTITUTE “NANOELEC”

“ESRF and ILL offer unequalled performance to characterise advanced nano- and micro-electronics”

To catalyse this use by industry, the IRT NanoElec has established a Pathfinder Programme to develop an improved interface between the ESRF, ILL and CEA-PFNS and industrial nano/micro-electronics R&D.

Four core components:

1. **Define characterisation needs** responding to industrial R&D&I
2. **Put in place technical and human support/resources**
3. **Perform test cases** put forward by NanoElec partners, and further afield
4. **Training, dissemination and communication**

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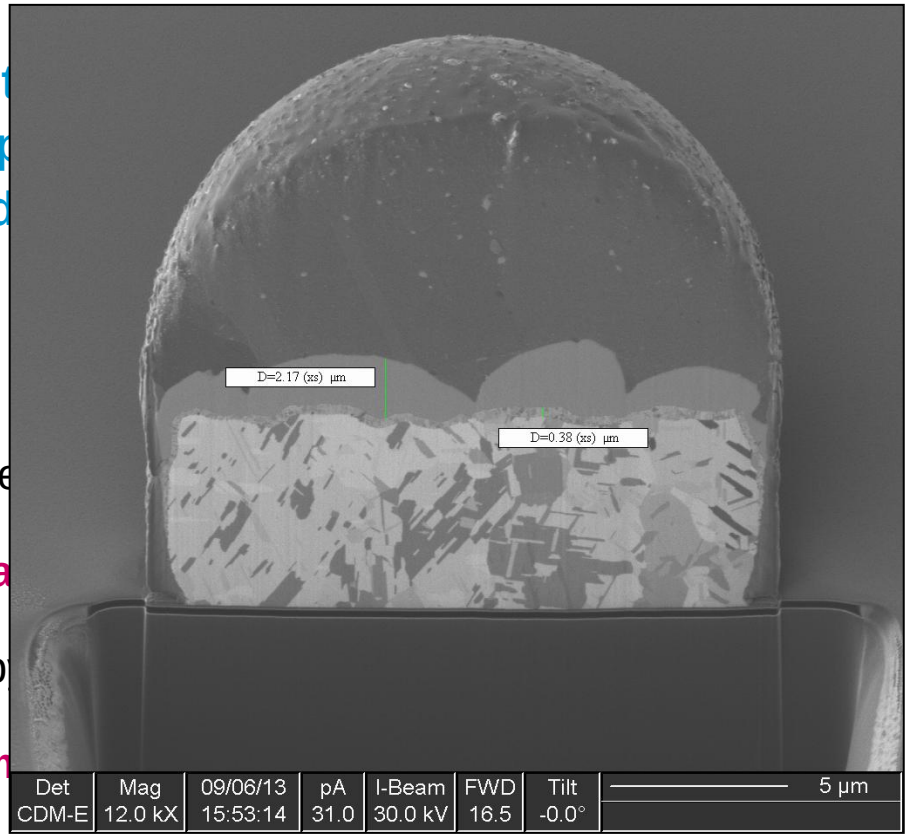


EXPLOITING AND INNOVATING WITH ESRF IP

- Out-License instrument designs
- Manufacture unique equipment
- Consult engineering design
- Patents are not a favourite tool
- Our software is open source
- Member of EIROForum IMK-TT, TTO-Circle, GRAIN/GRAVIT

Key part to play in ESRF's role as a synchrotron technology nursery

ICEPAP motor controller

Enhanced diffraction limited storage ring ESRF 2019

Translates to more concentrated photons and more coherence:

- “Nanobeam” science.
- **Industry opportunities, but also challenges to support “non-standard” techniques and data analysis.**

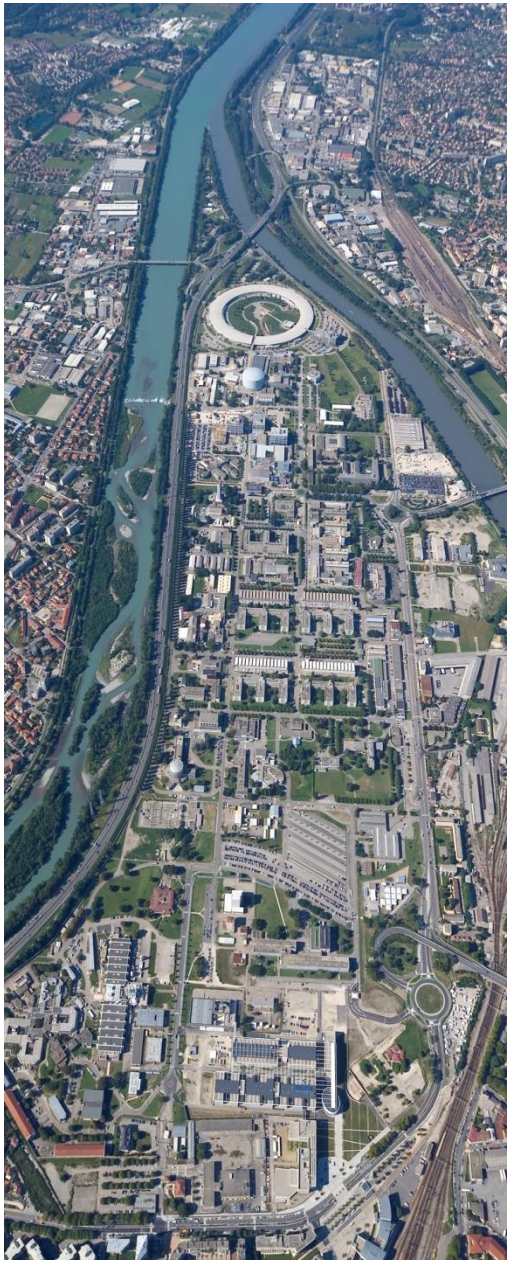
“PanDAAS”

EUROPE PUTTING MONEY WHERE THEIR MOUTH IS

European Commission

Exploiting the innovation potential of research infrastructures

- **R&D partnerships with industry** to develop Union capacities and industrial supply in high-tech areas such as scientific instrumentation or ICT;
- Stimulate the **use of research infrastructures by industry**, e.g. as experimental test facilities, innovation hubs, knowledge-based centres;
- Encourage the integration of research infrastructures into local, regional and global **innovation systems**;
- **Pre-Commercial Procurement and Public Procurement of Innovation** by research infrastructure actors to drive forward innovation.



We do not have the answers either…
….but we're trying to go in the right direction!

Thank you for your attention.

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