





Röntgen, 1895



3 cm



Materials Characterisation at the Micro-Scale: European Photons and Neutrons Campus Grenoble, France



Ed Mitchell

Head of Business Development, ESRF

Honorary Professor, Research Institute for the Environment, Physical Sciences and Applied Mathematics, Keele University (UK)

- Société Civile under French law
- Budget 95MEuro
- 40 X-ray facilities, each with its own specialisation
- 600 staff



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%
South Africa	0.3%

Why are synchrotron X-rays special?

1) High brilliance

- High spatial resolution (tens of nm)
- High-speed measurements (kHz)

2) High coherence

- Sophisticated imaging experiments

3) Tunability

- Element-specific measurements & speciation

4) High energy

- Penetration in bulky or dense samples

5) Time structure

- Down to 100 ps time resolution

6) Polarisation

- Experiments sensitive to magnetic properties

Bulk & surface properties

Chemical sensitivity

2D & 3D spatial resolution

Time resolution

In-situ & non-destructive



ArcelorMittal



TOTAL



Bayer HealthCare
Bayer Schering Pharma

Medivir

Schneider
Electric

AREVA

MERCK

Vernalis

astex
therapeutics



Rhodia

GALDERMA
R & D
SOPHIA ANTIPOLIS

novo nordisk®

CORNING

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

Sareum

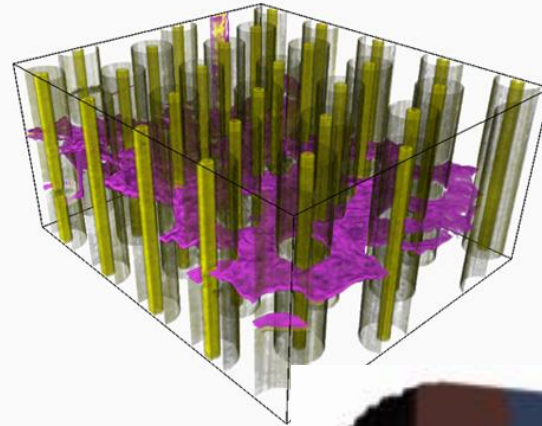
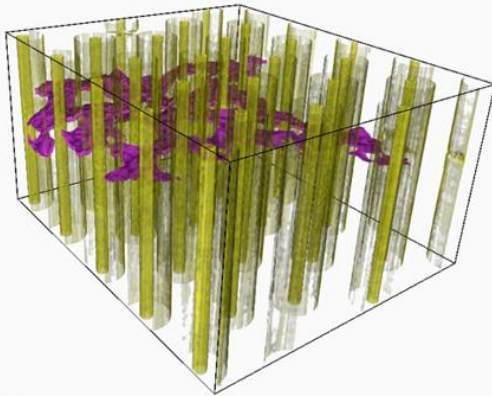
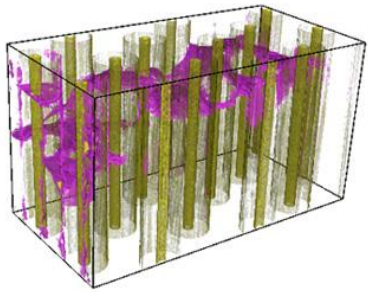
DAIHATSU

AstraZeneca

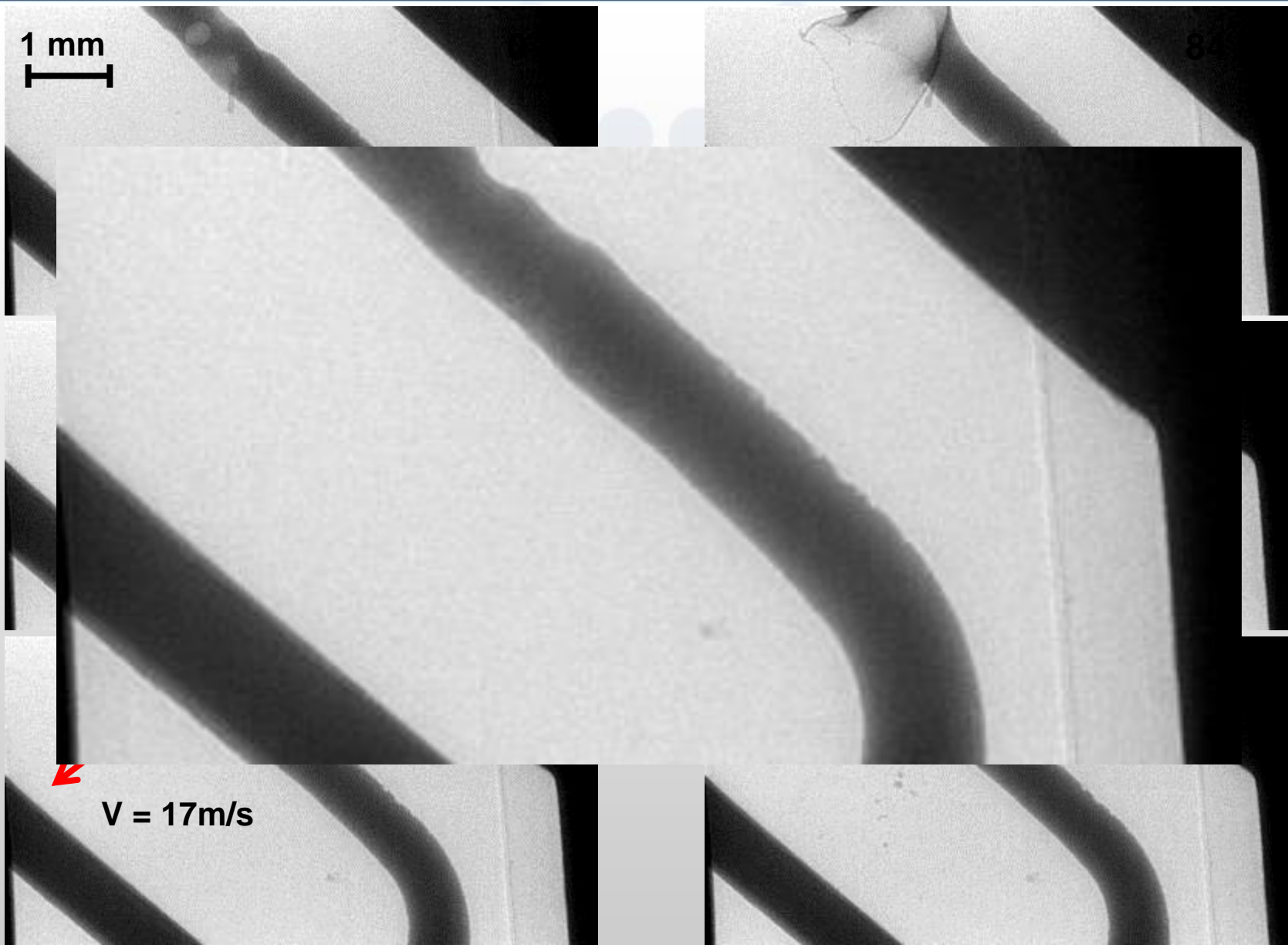
Unilever

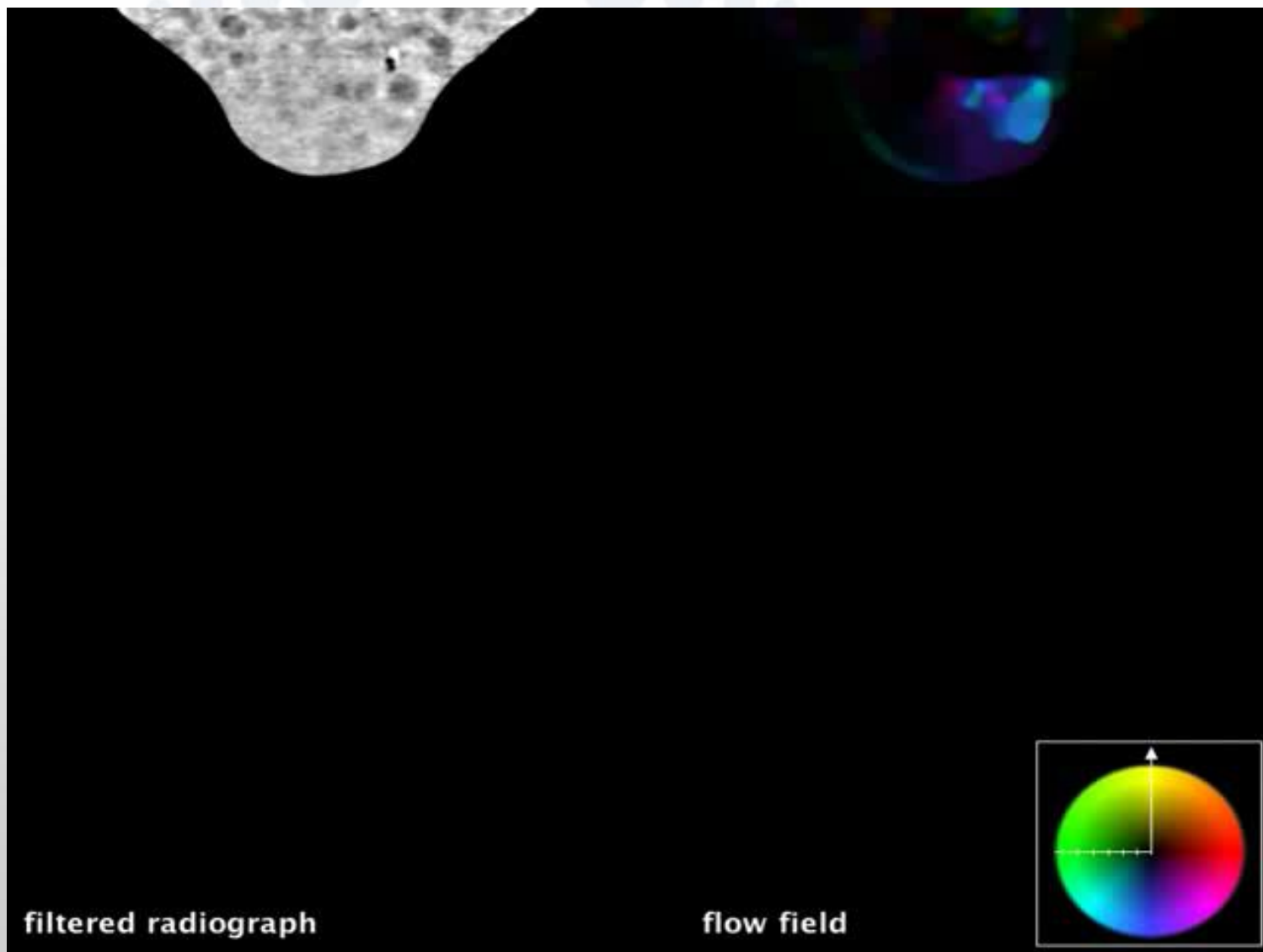








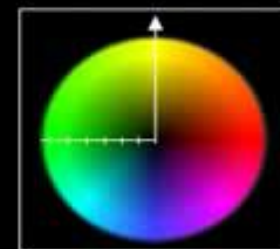




S. Zabler (a), A. Ershov (b), A. Rack (c), F. Garcia-Moreno (d), T. Baumbach (b), J. Banhart (d,e), *Acta Mater* **61**, 1244-1253 (2013).

filtered radiograph

flow field



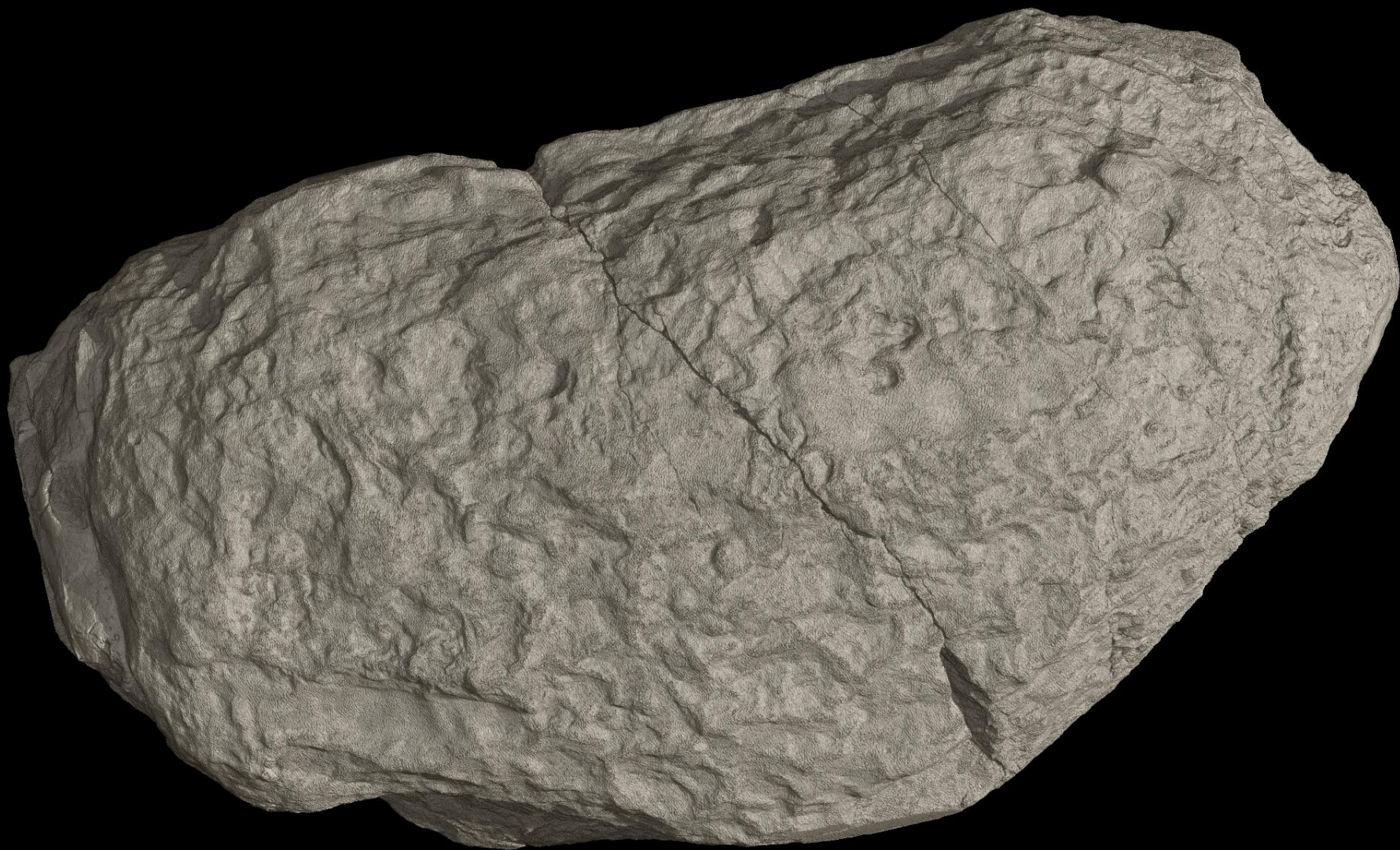


250 Million
years ago

South Africa

V. Fernandez
et al.
PLOS ONE 8,
e64978
(2013).

Early Triassic Odd Couple: Injured amphibian and aestivating therapsid share burrow



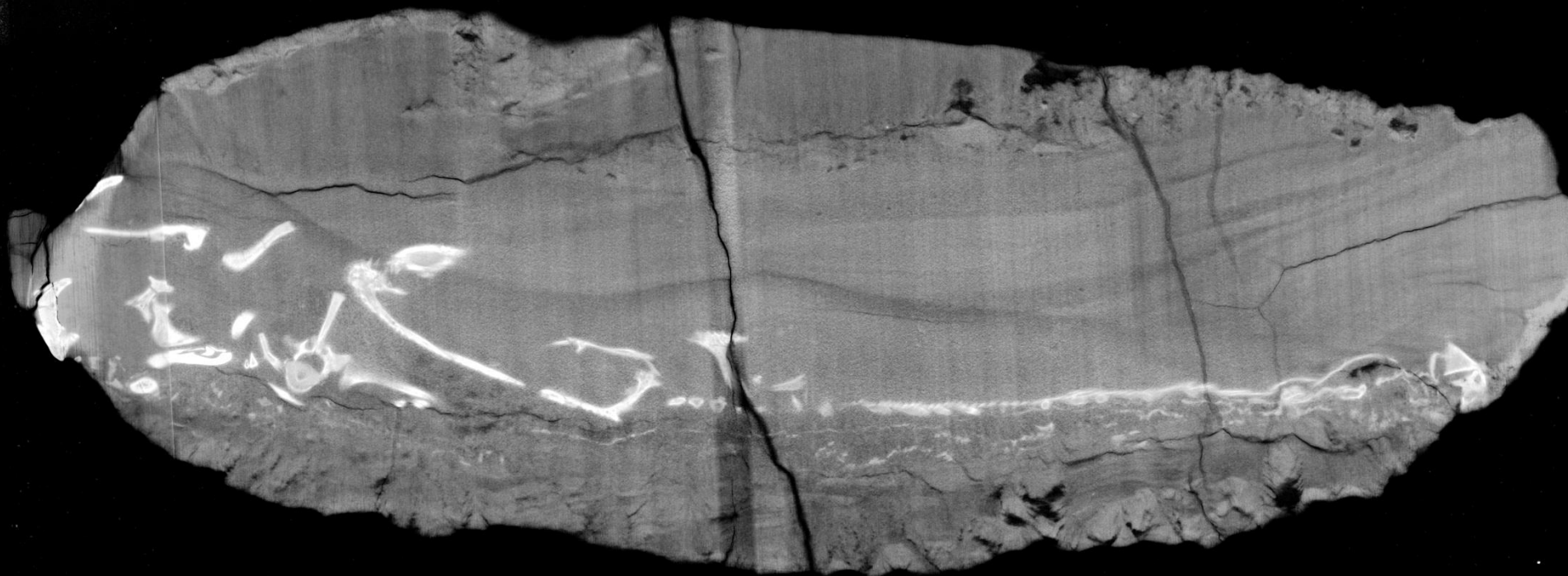
3 cm



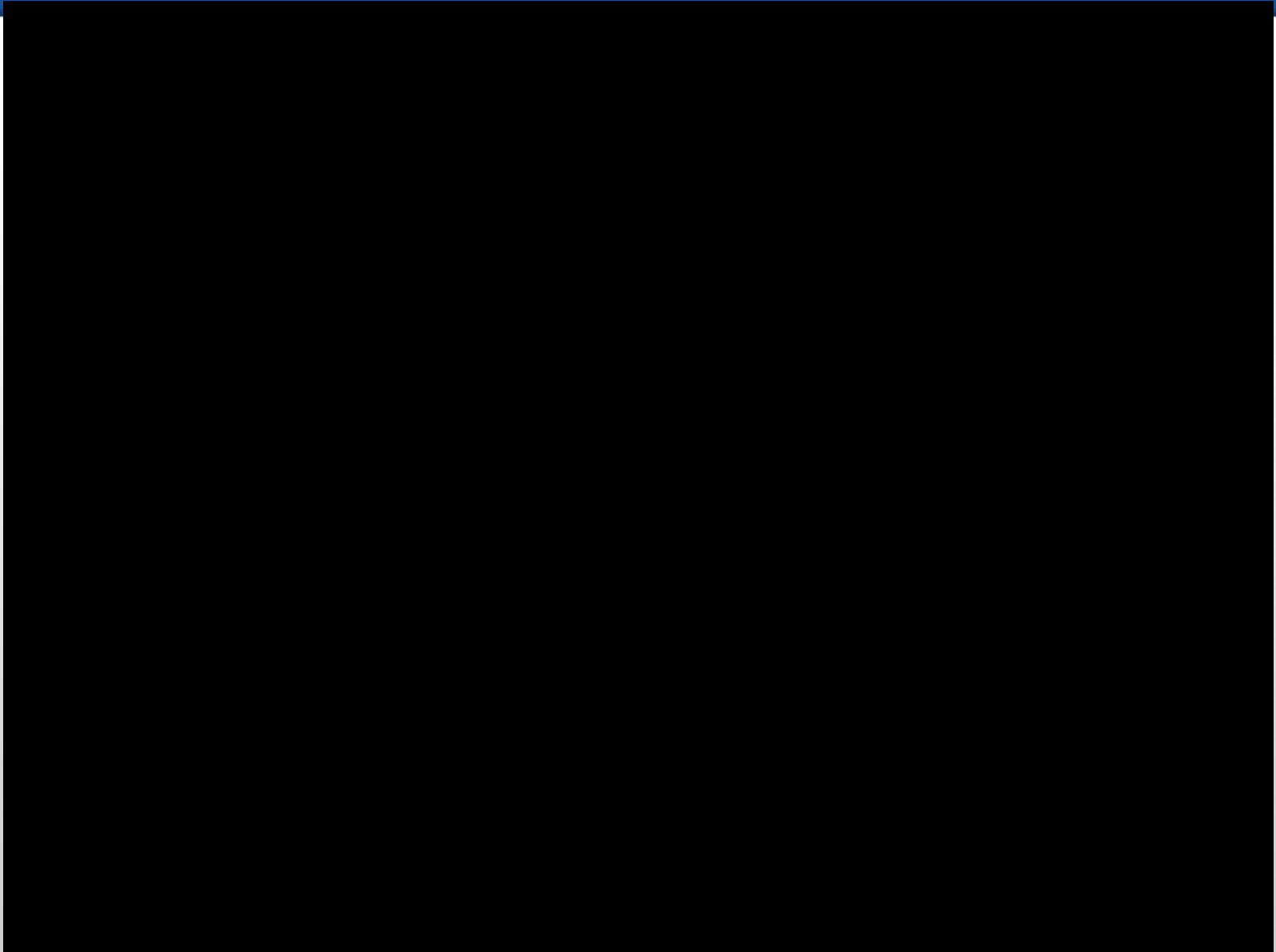


3 cm





15mm



Sharing a burrow – Vincent Fernandez

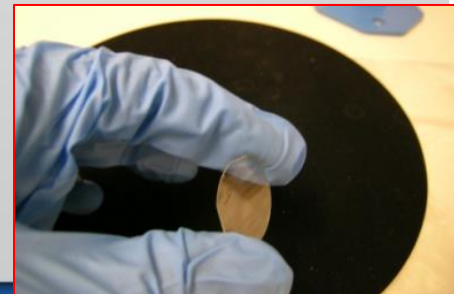
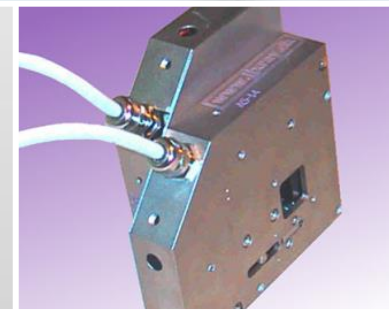
How to access our facilities?

	1. Publishable	2. Proprietary
Delays	Twice yearly proposal rounds	Fast track access any time
Access	Selection by external review	Organised by Business Developments Office (BDO)
Cost	Free	Charged
Experiment	Assistance by beamline scientists	Assistance by beamline scientists and BDO staff, and analytical services available
Mail-in Services	No	Yes
IP	Publication of results obligatory	Confidential and intellectual property belongs to user
Travel and guesthouse	Travel and accommodation paid if member country	At cost of client

Exploiting ESRF IP

- **Licensing** instrument designs
- **Manufacturing** unique equipment for other RI
- **Helping** for engineering design
- **Our software** is open source

Key part to play in our role as nursery for developing and transferring synchrotron technologies





- **We welcome industry to use our facilities**
- **The ESRF Business Development Office is your dedicated point of contact**
- **Free peer review access, proprietary access, research collaborations and partnerships**

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