



Institut des Sciences de la Terre

OSUG



# Report on the Mandate

## 2014-2019

*Conseil Scientifique 17-18 Avril*



# Scientific Objectives



The **physical** and **chemical** study of the Earth system by combining **observations** of **natural** objects, **experimentation** and **modelling** of associated processes

2 axes : Georesources &  
Alpine Observations

**Links** between Observation & Research

# Scientific Objectives -1



- **Develop a Georesources/Transition Energy Axis**
  - Recruitment of a Pr, support for the Start-up Hymagin, Air Liquide Chair (3 teams), European funding for the thematic teaching of Georesources : Open your Mine »
- **Develop Alps research** (link between Obs-Research, Geology/Geophysics)
  - Labex : AO Alpes, CIFALPS 1-2, AlpArray, RGF-Alpes, EPOS, RESOLVE, 3 POIA, recruitment of a researcher, recruitment of 2 adjoint-Physicists (Landslides, Accelerometry)
- **IDEX integration**: 3 CDP (Risk@UGA, Origin of Life, DATA UGA)
- **Supporting selective projects** : 4 ERC, 1 more by transfer (N. Shapiro), 4 ERC submitted, 1 projet ITN, 45 ANR, 2 EQUIPEX en cours.

# Scientific Objectives - 2



- **100% active researchers** (internal funding) 
- **Enable all themes to develop** (by recruitments, by financial support)
- **Develop a research policy with South Countries** (3 priority areas of works)
- **Strengthening links with industry** (contract service, Consortium, 2 Start-Ups, 1 Labcom, H2 chair project ...)

# Human Resources objectives - 1



- **Values:** equity, solidarity, kindness, respect for everyone.
- **Supporting the career of technical staff :** 19 persons/40 were promoted

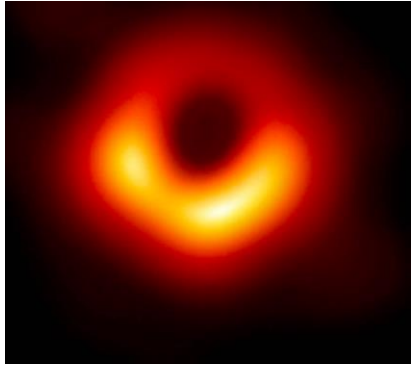


- **Supporting the Advancement of Women**
  - 3 Phys promoted, 2 DR promoted, 2 adjt-Phy recruited (UGA)
  - no women recruitment (CNRS, IRD, teachers)

# Human Resources objectives - 2

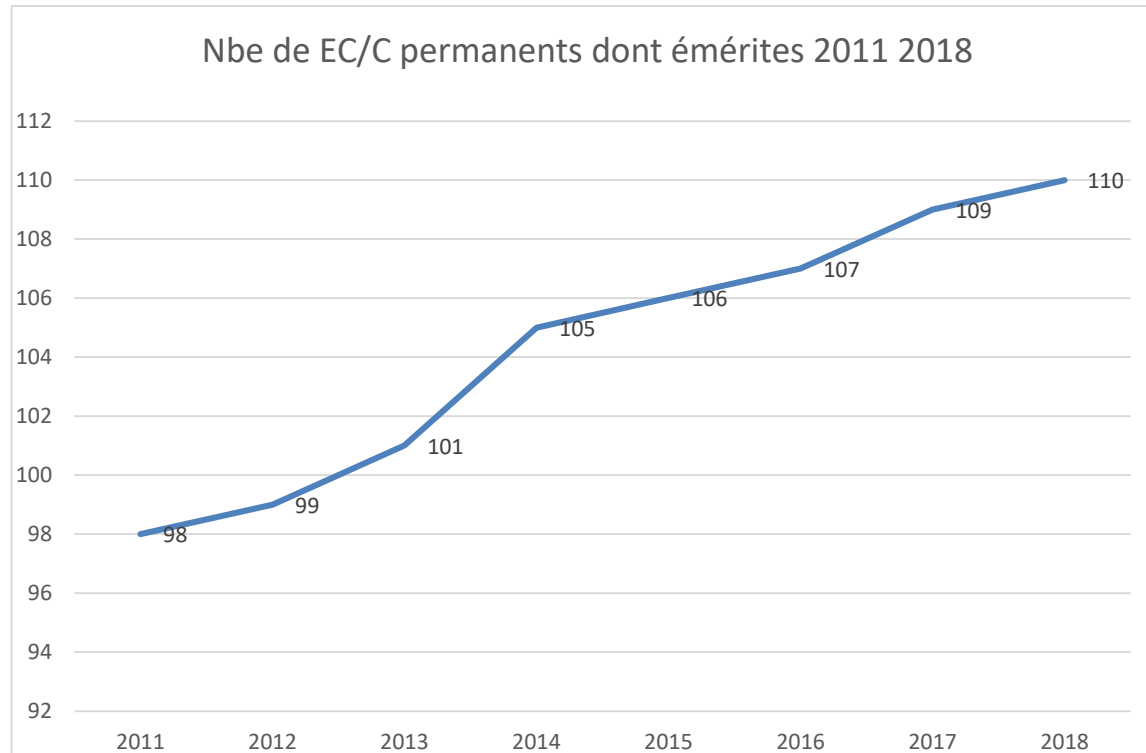


- **Rationalize the work of technical staff:** creation of services and platforms
- **Collegial decisions,** in close and permanent consultation with the Management Committee and the Laboratory Council
- **fruitfull exchanges** with the 5 organisations, the Pole and the Observatory

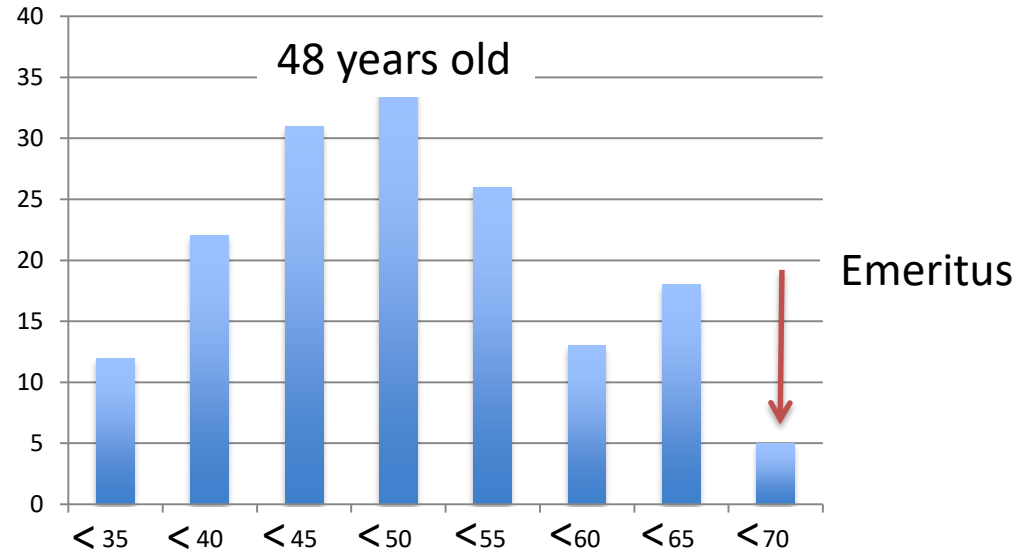


# Attractivity

Regular increase of permanent scientists  
by 12 recruitments (UGA, CNRS, CNAP, IRD)  
and 7 transfers (CNRS, IRD) since 2014  
(14 departures)



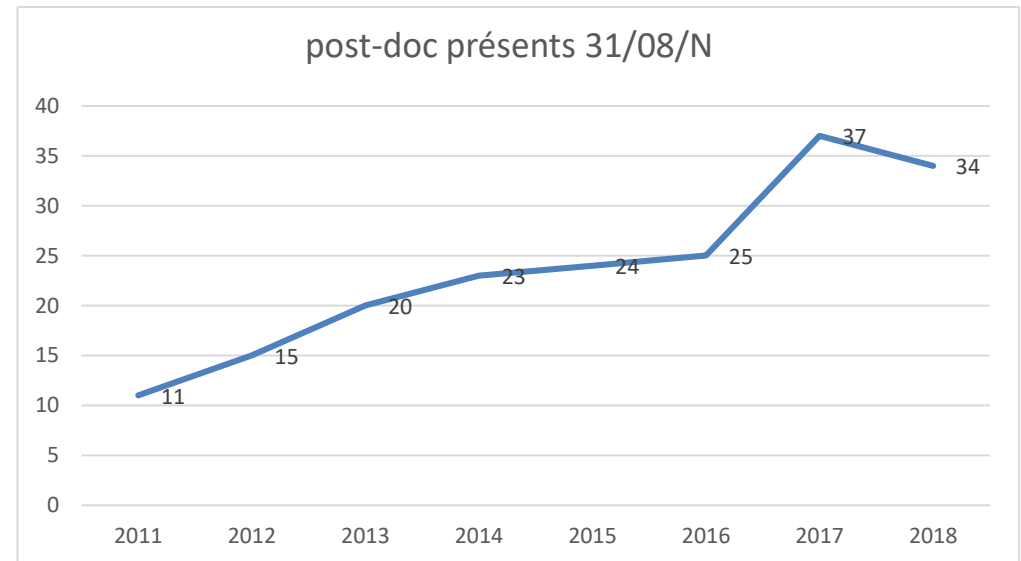
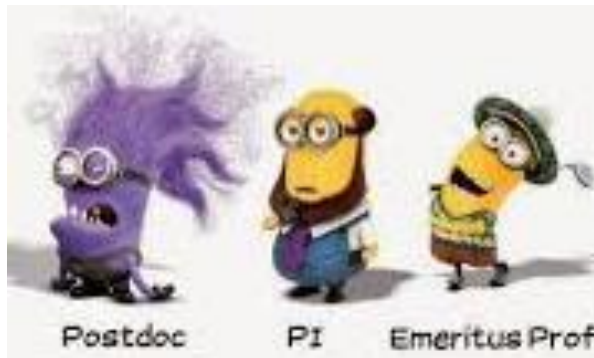
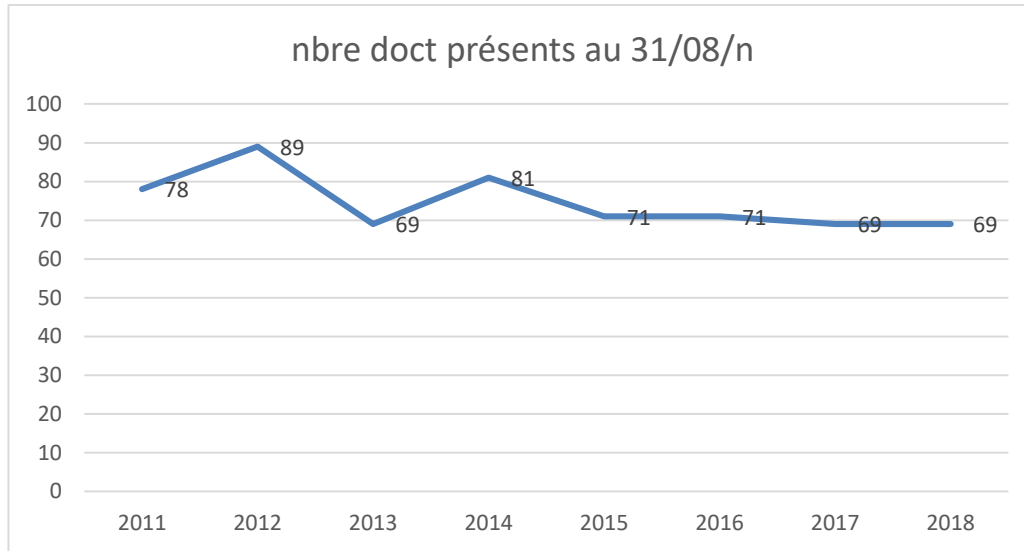
# age pyramid of scientists



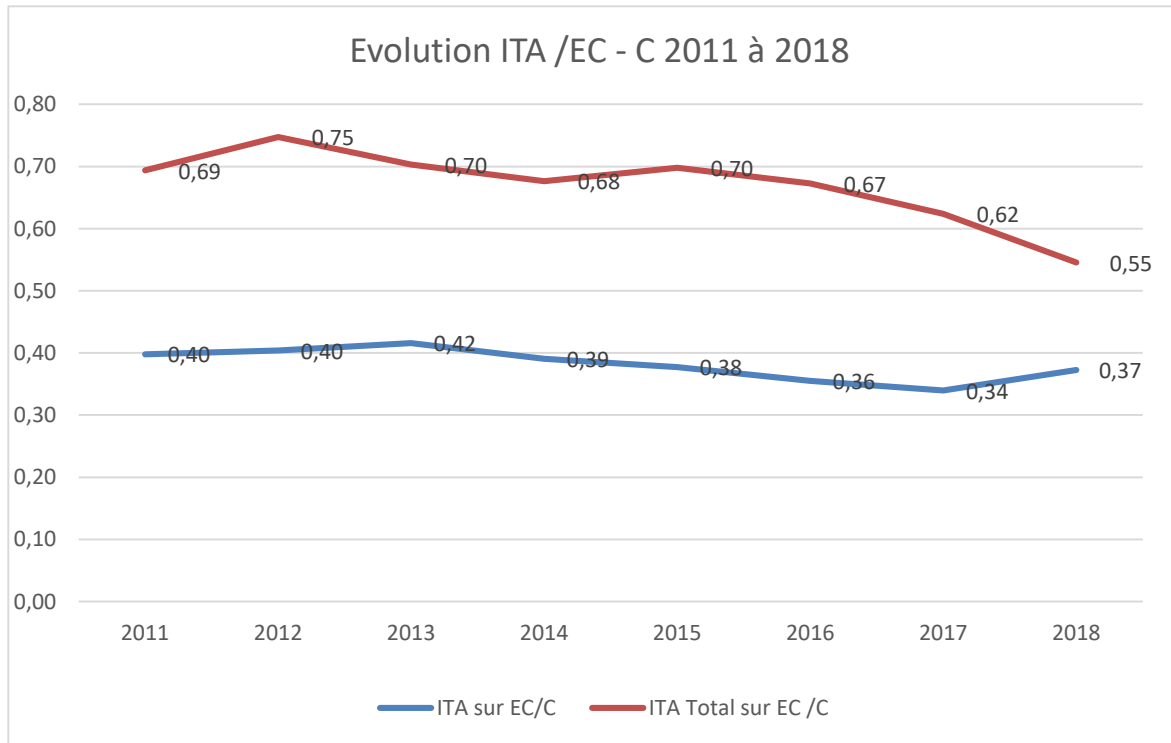
7 EC dont 2 USMB  
7 C (CNRS, IRD, IFSTTAR)  
2 ITA



# PhDs & Post-Doc



# Ratio Technical staff/Scientists



**Légion d'Honneur:** M. Campillo

**Palmes Académiques :** M.L. Dohan



**Membre of the Russian Academy of Sciences:** A. Sobolev

**Bronze Medals of CNRS :** M. Radiguet & L. Métivier

**New IUF Pr :** P. van der Beek, A. Sobolev, A. Simionovici

**Price:** J. Braun, P. Poli, M. Campillo, P. VanderBeek, A. Van Driessche, J. Virieux, C. Beck, R. Brossier, L. Métivier, A. Helmstetter, M.M. Doan, L. Charlet

**New AGU/EGS fellows :** C. Chauvel, A. Revil

**PhD prices:** J. D'amato, H. Guillon, L. Airaghi, M.Le Breton J.Umlauf, A. Astorga, C. Bissardon, E. Merkulova, Z. Gazhoui

**MT 180s :** Philippe LeBouteiller

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# ANR and European Contracts (2010-2018)



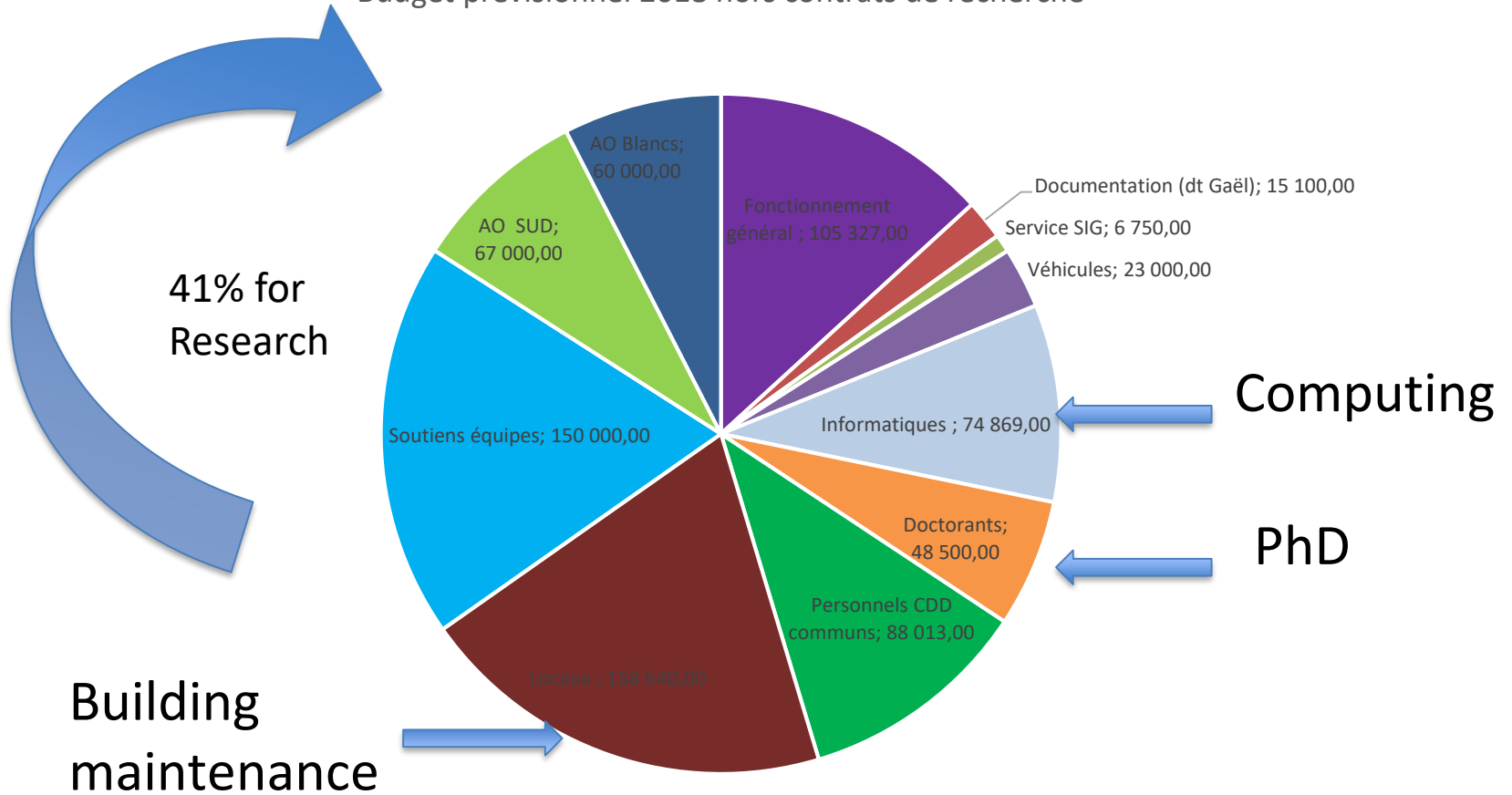
- 45 ANR contracts ( 24 as coordinator)  
16% success rate
  - 25 European contracts (16 as coordinator)  
including 4 active ERC (ca. 20% success rate)
    - Budget 2018 : ca 6 Meuros
- Including 25% from Industry



# Operational Budget : ca. 800 keuros



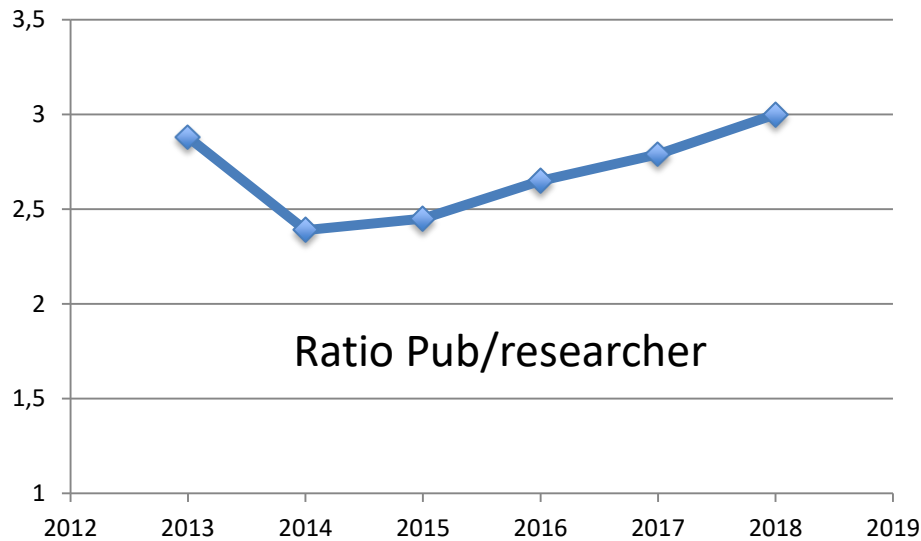
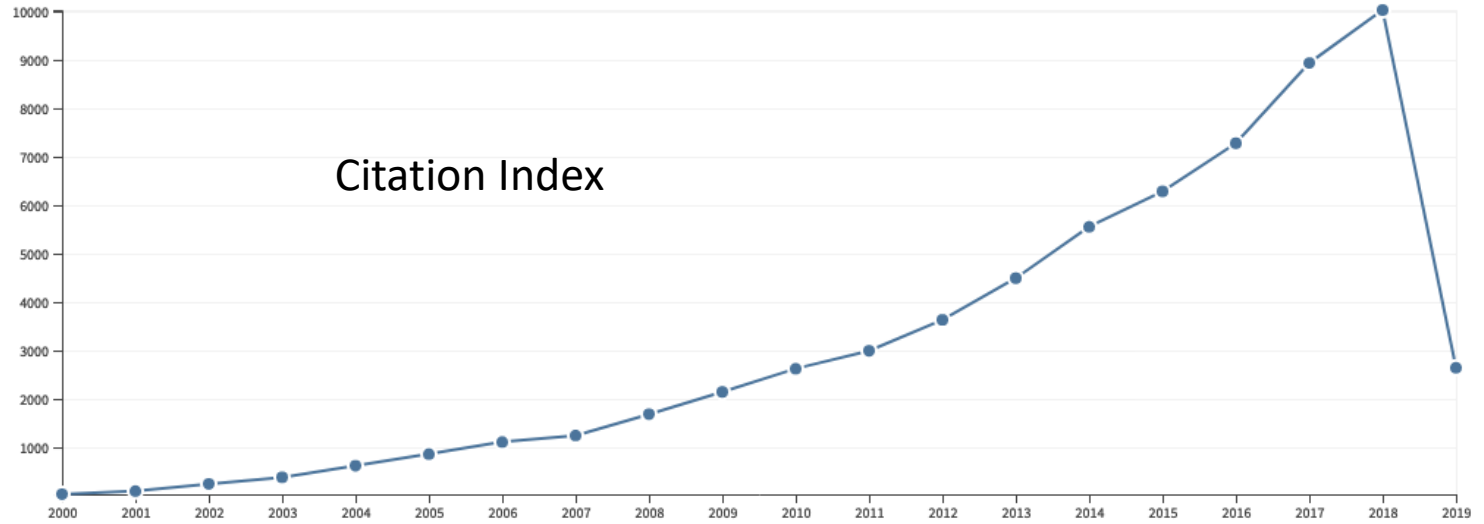
Budget prévisionnel 2018 hors contrats de recherche



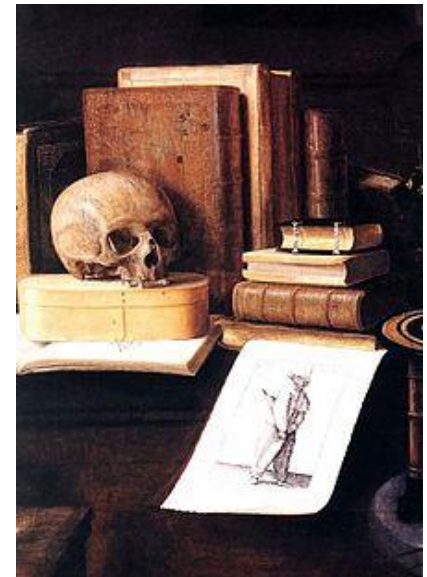
- Fonctionnement général
- Documentation (dt Gaël)
- Service SIG
- Véhicules
- Informatiques
- Doctorants
- Personnels CDD communs
- Locaux
- Soutiens équipes
- AO SUD
- AO Blancs



WEB OF SCIENCE™



## Bibliometry







# Rankings



## Earth Sciences

UGA 2015 : 51<sup>st</sup> worldwide

UGA **2018** : 18<sup>th</sup> worldwide

USMB **2018** : 44<sup>th</sup> worldwide

Signature unique :

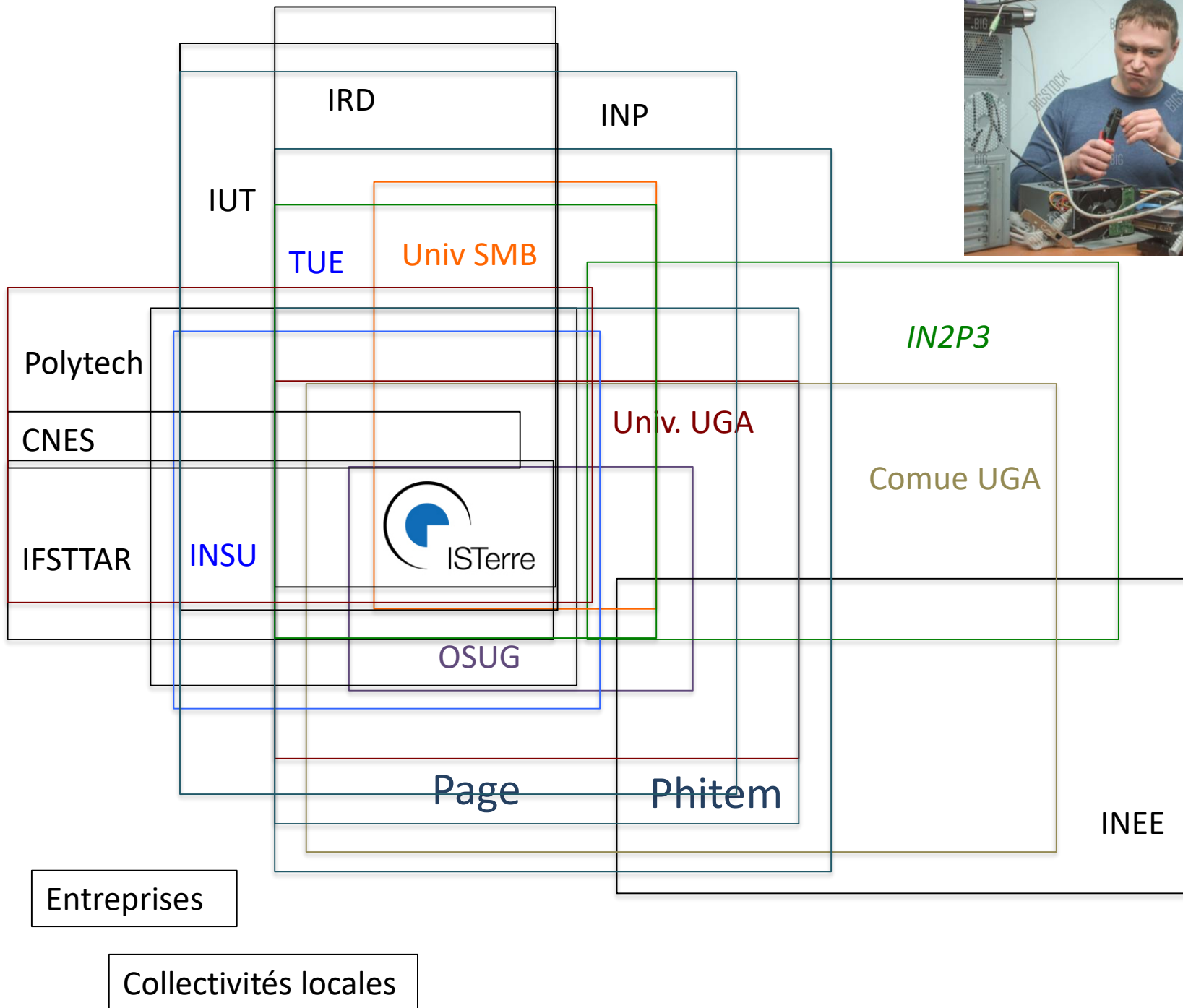
*Univ. Grenoble Alpes, Univ. Savoie Mont-Blanc, CNRS, IRD, IFSTTAR, ISTerre, 38000 Grenoble, France*



New amphitheatre  
New administration  
2 classrooms  
New conviviality room  
New technical Hall

28 new offices  
a new visitor office

2 Meuros  
(funded by state & region)



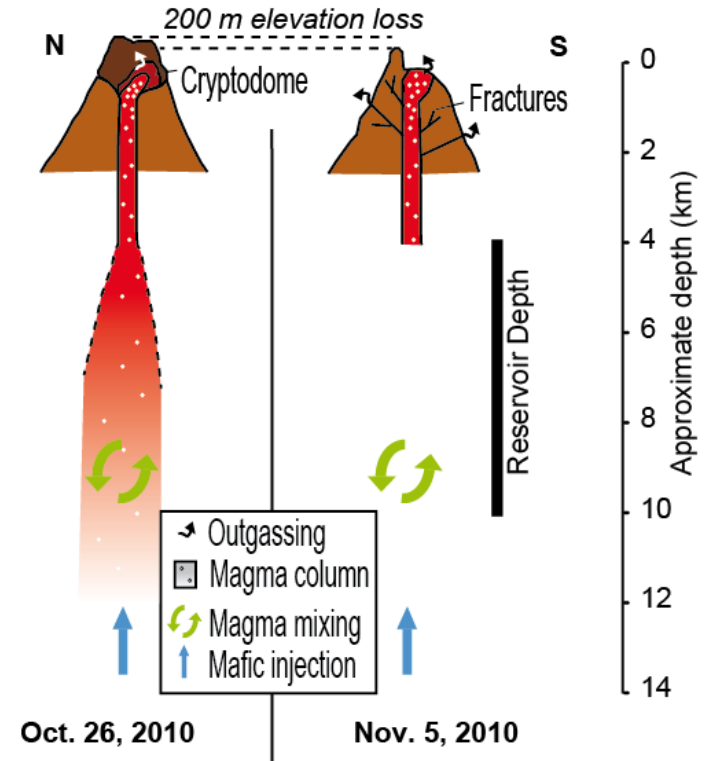




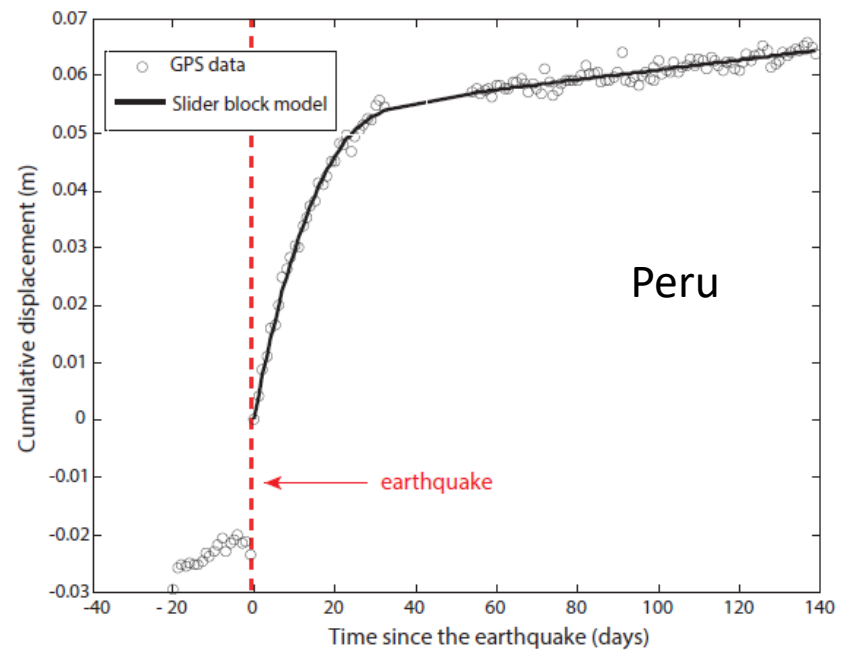
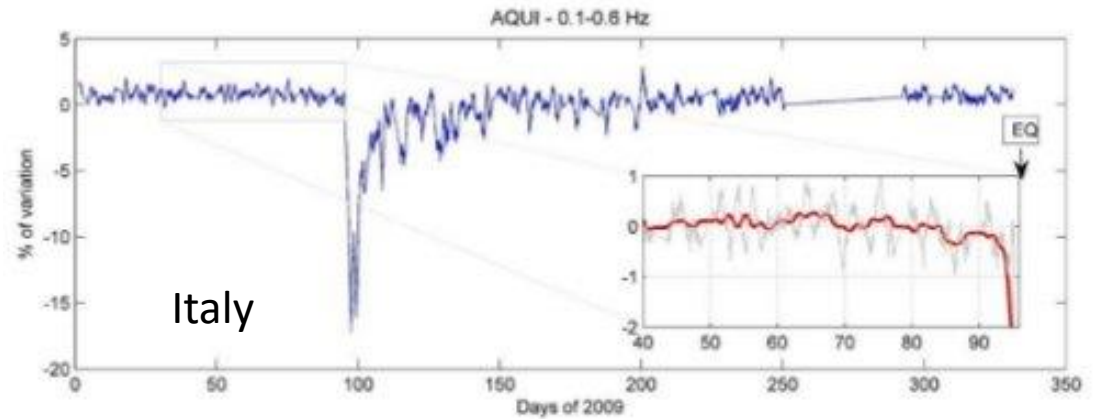
Some results



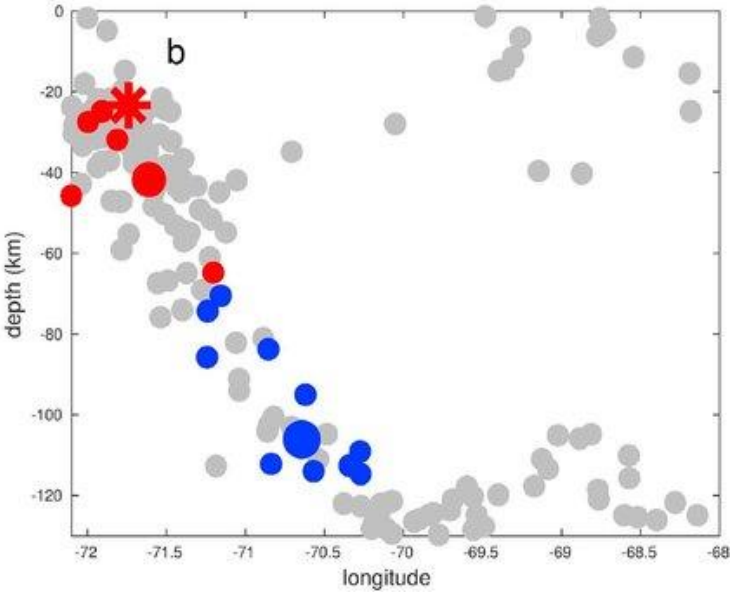
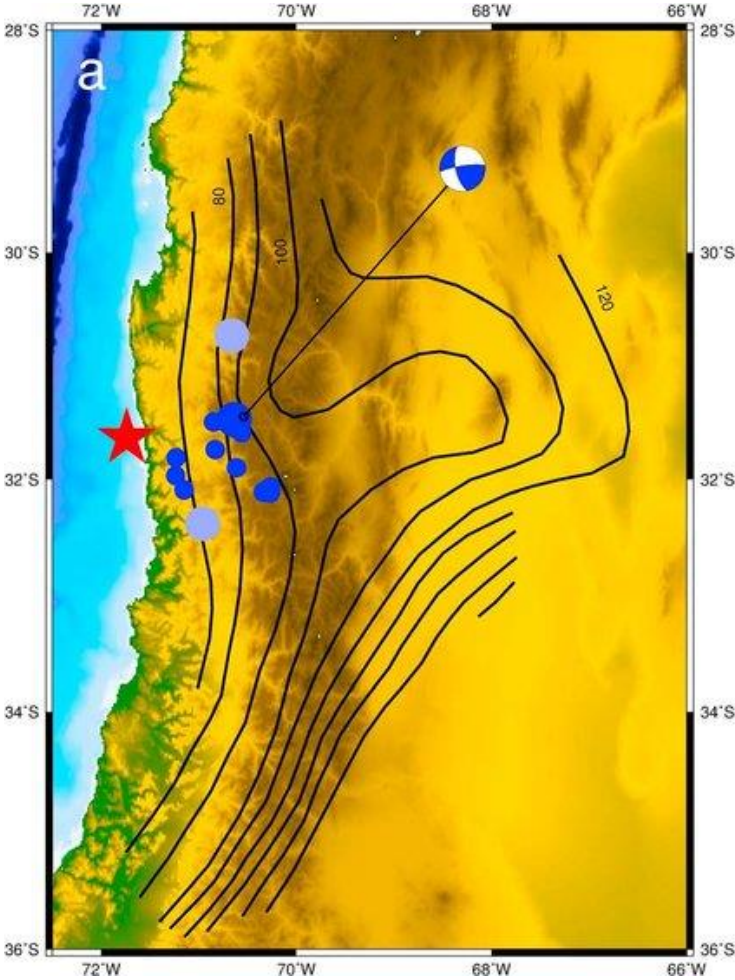
# Volcanoes : coupling observation and modeling



# Landslide & Earthquake : same mechanical behavior

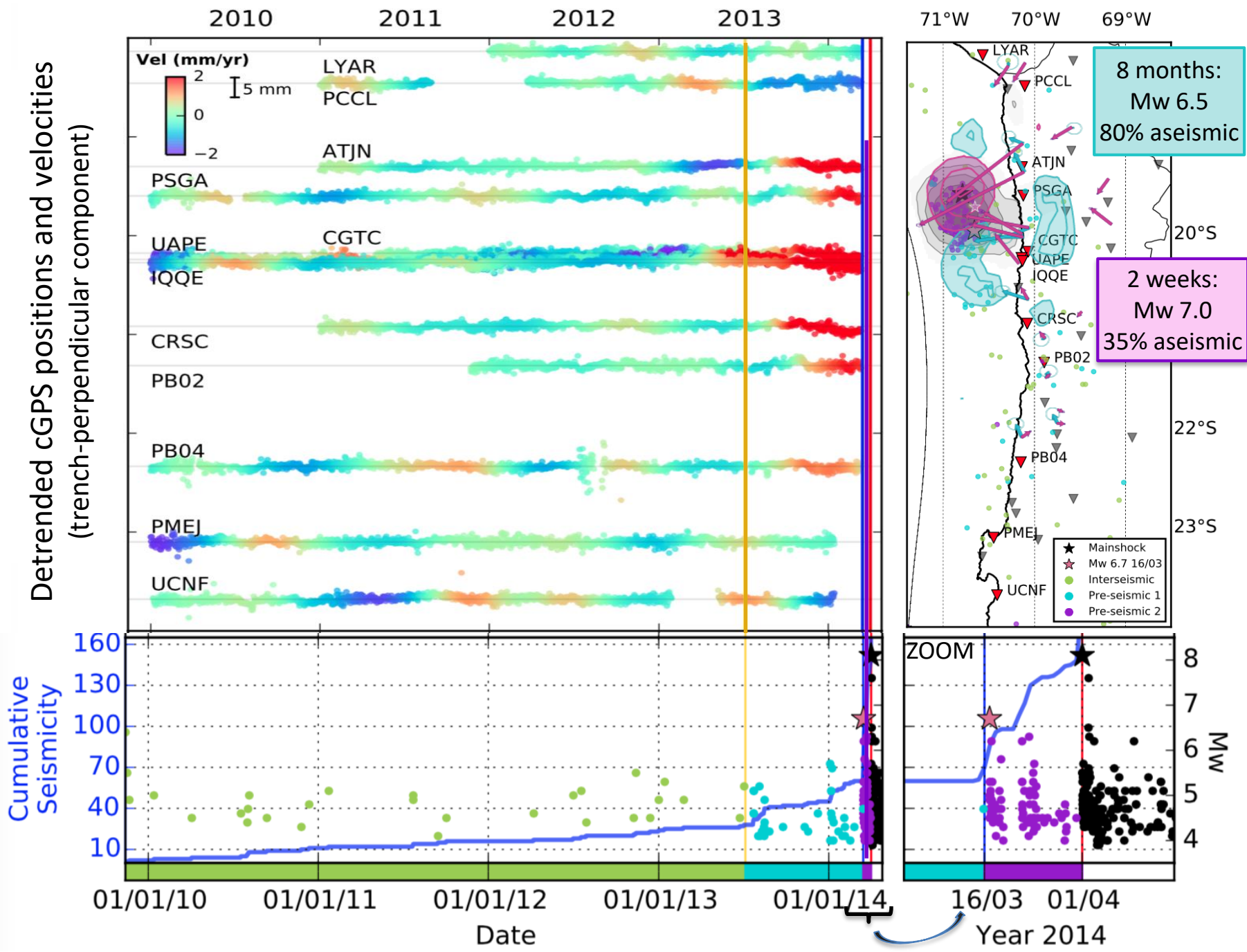


# Earthquake precursors

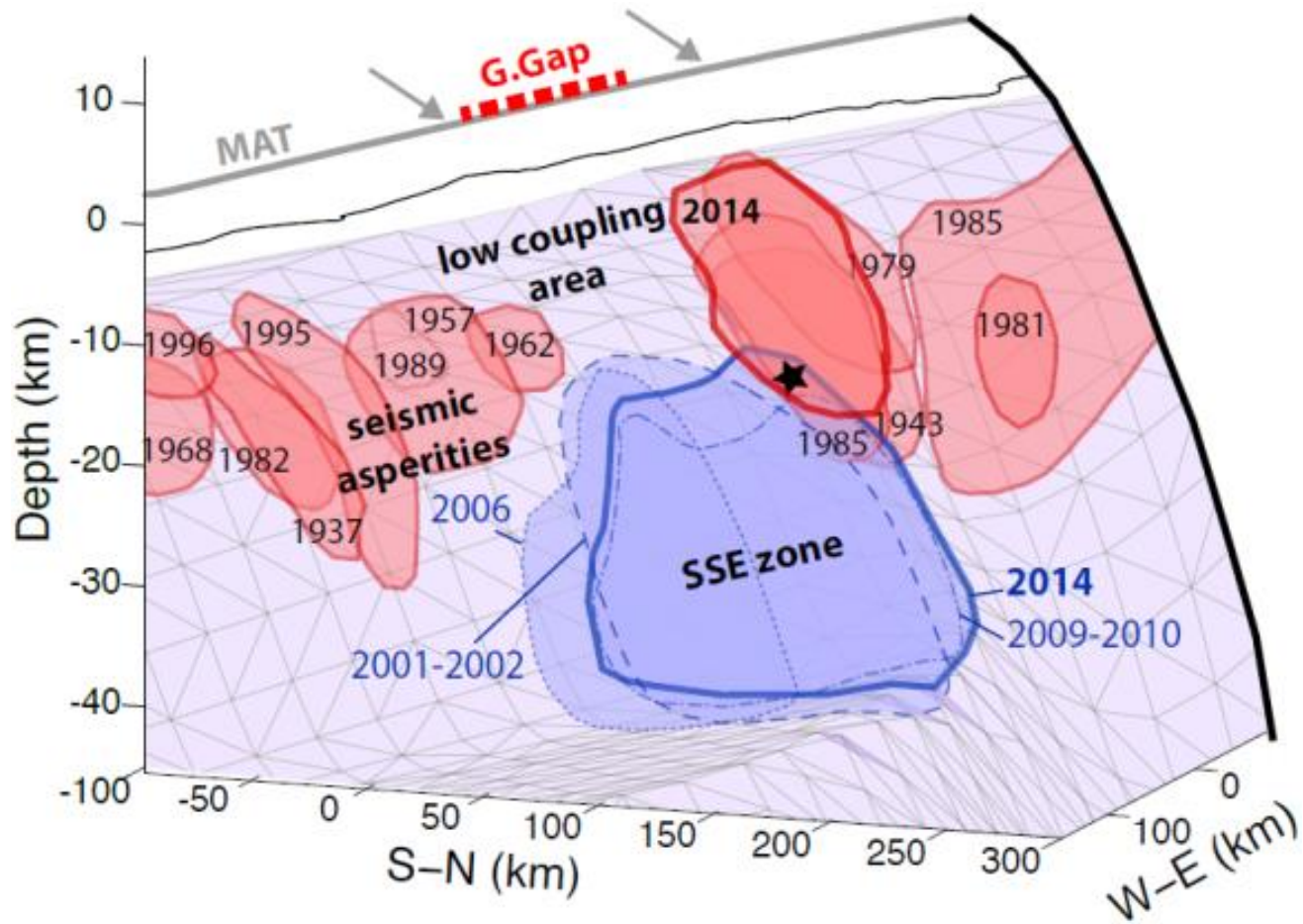


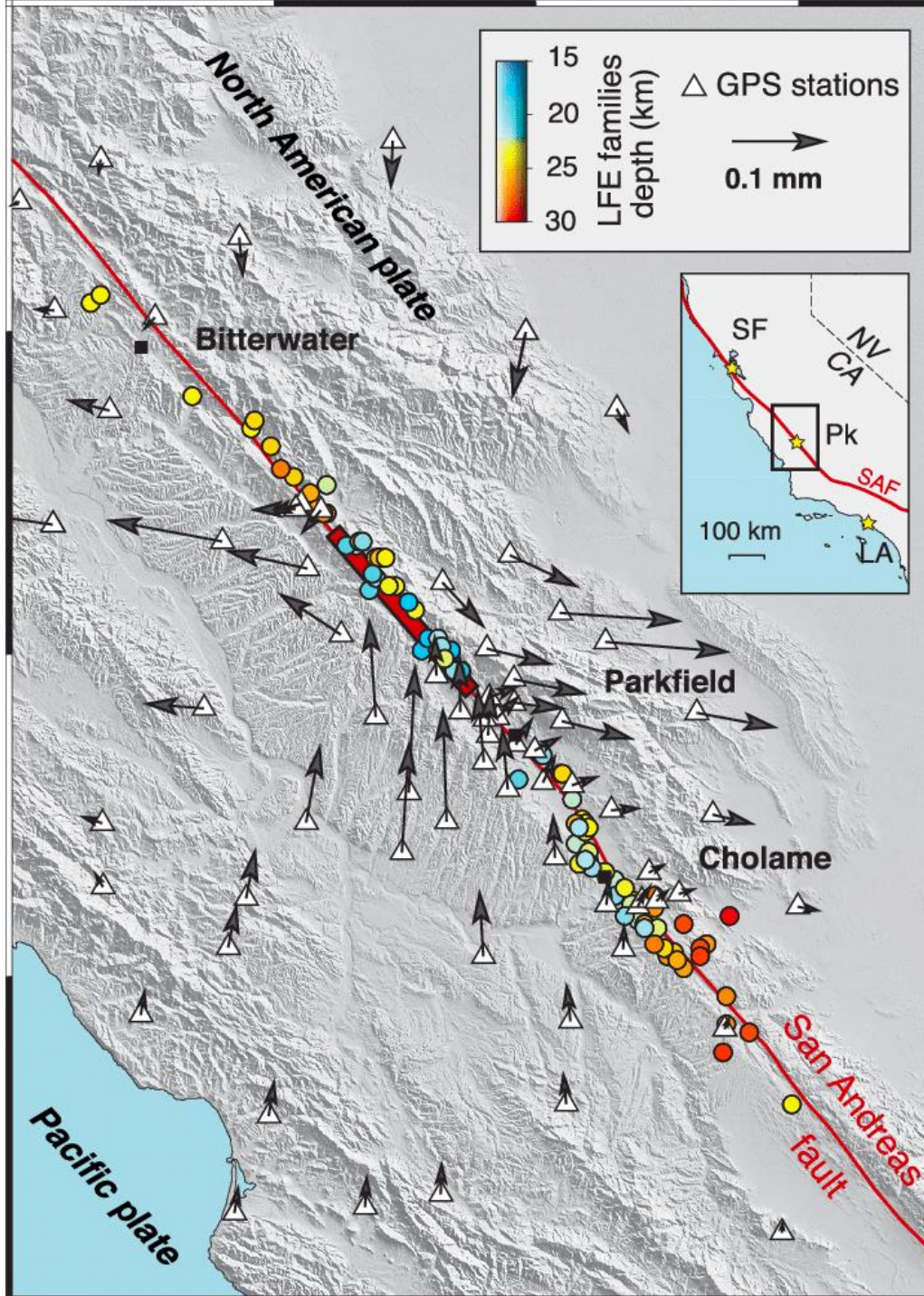


# An 8-month slow slip event preceded the Mw8.1 2014 Iquique earthquake (Chile)



# Combining seismology and Geodesy : SSE localisation and characterisation

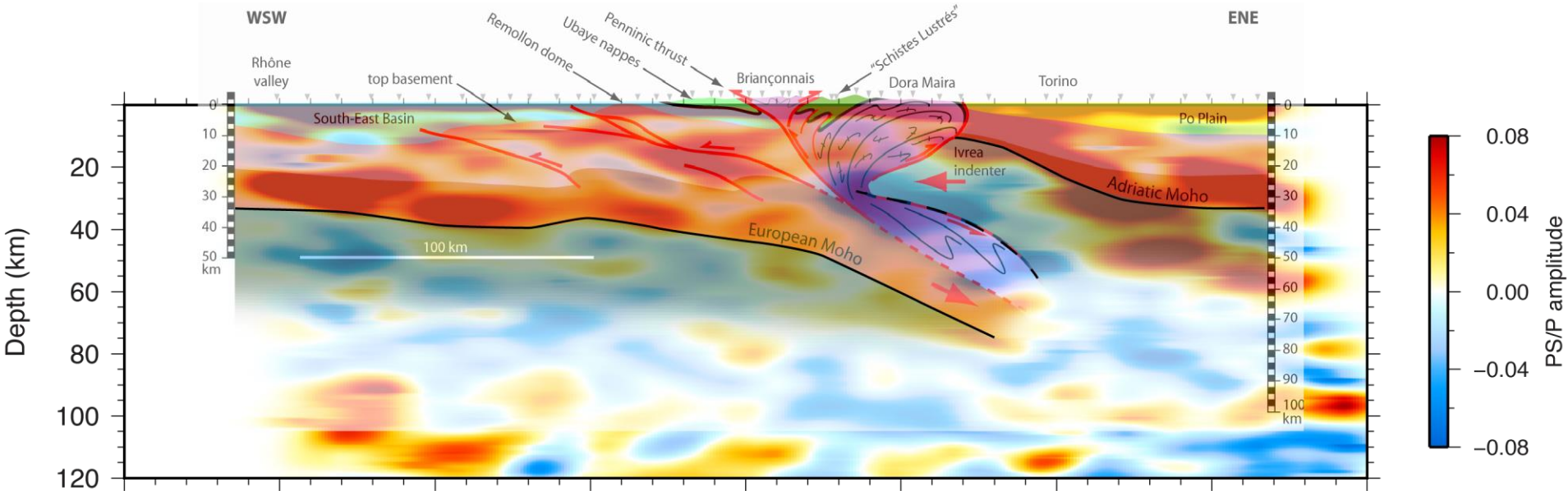




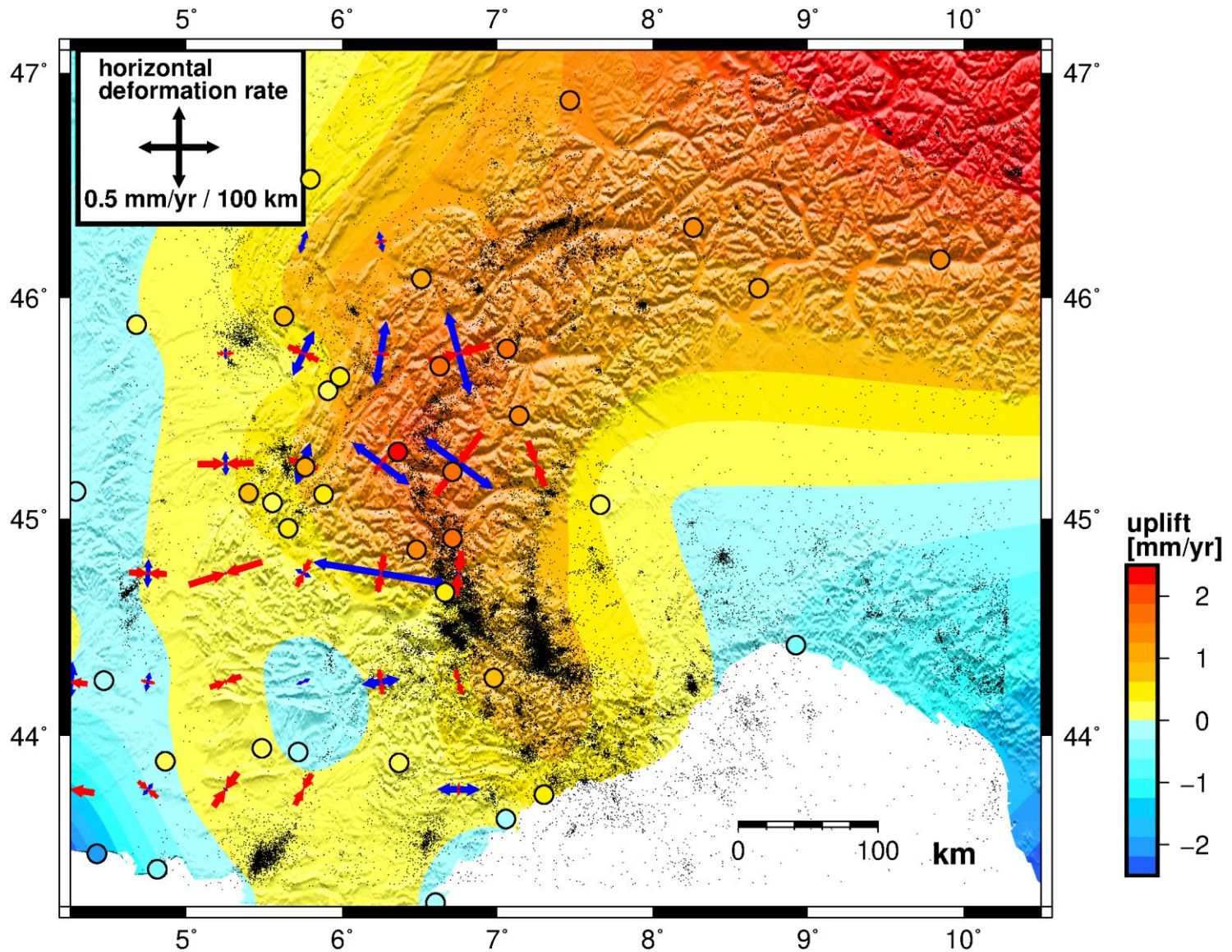
## Seismology & Geodesy

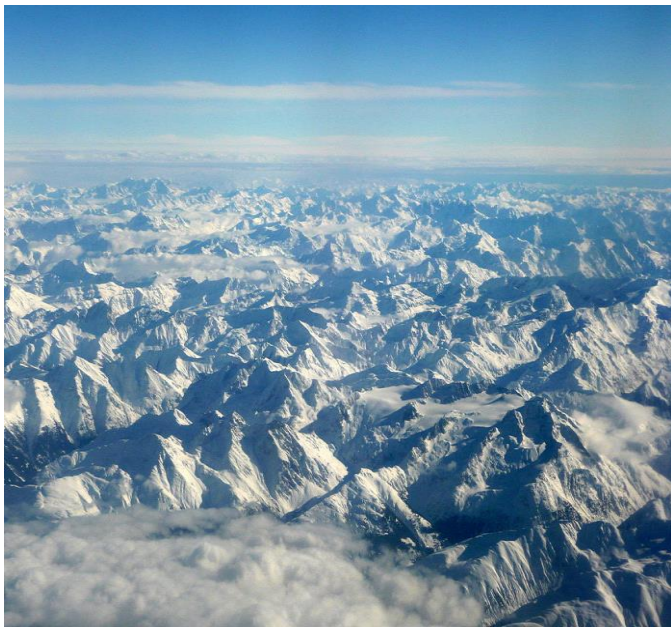
Slow slip events in the roots of the San Andreas fault

# Geophysical imaging & Geology : the Alpine study case

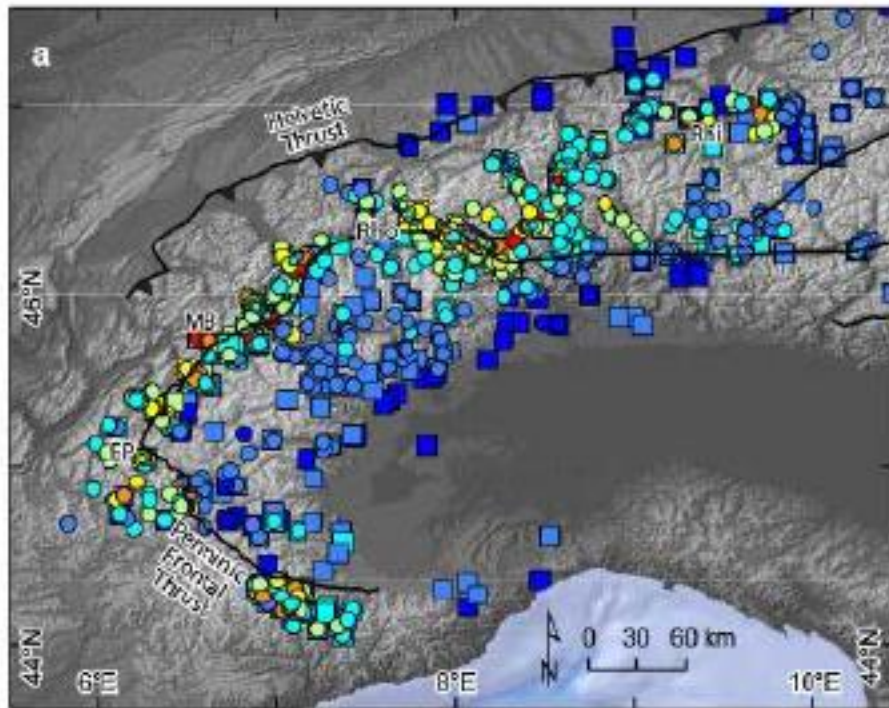
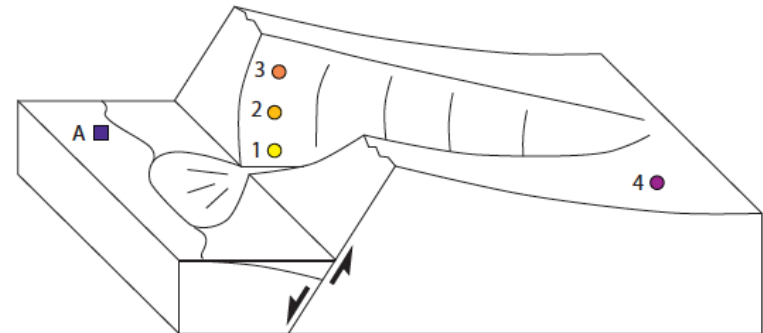
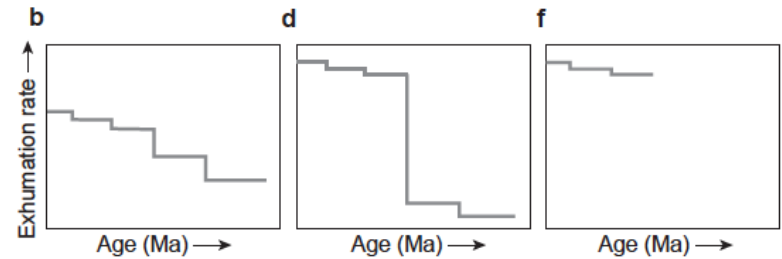
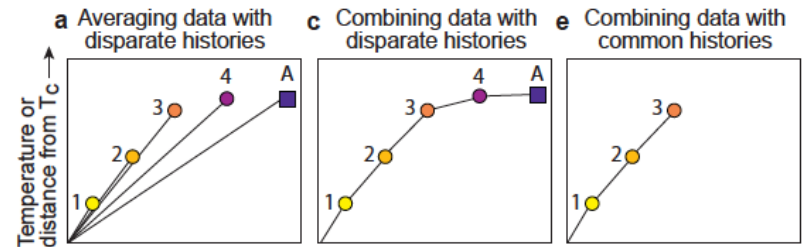


# Long-term geodesic observation : alpine uplift



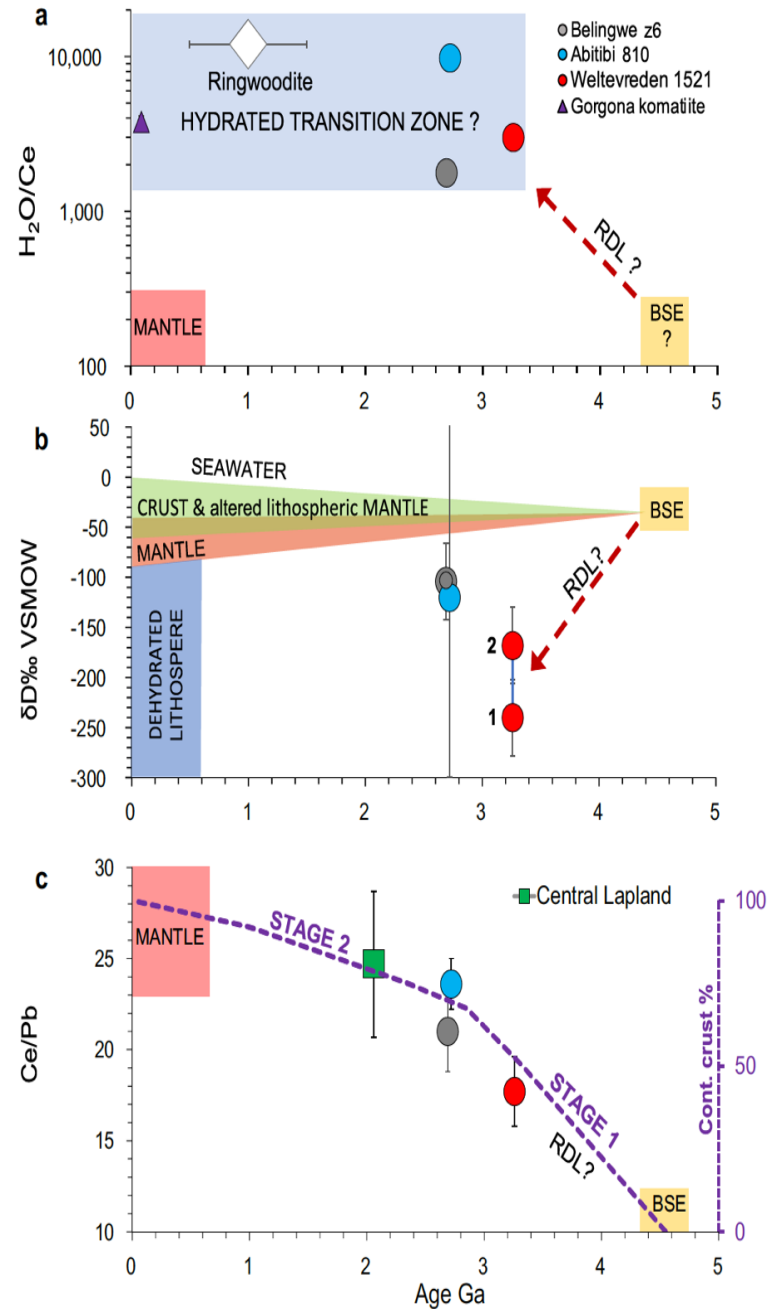
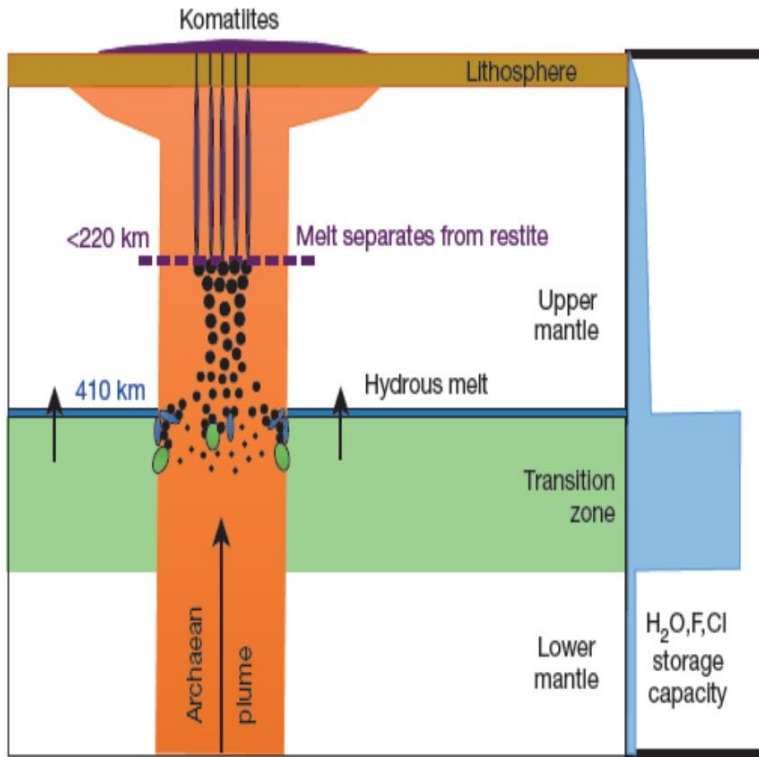


# Thermochronology & modeling reinterpretation of exhumation rate In the alpine region



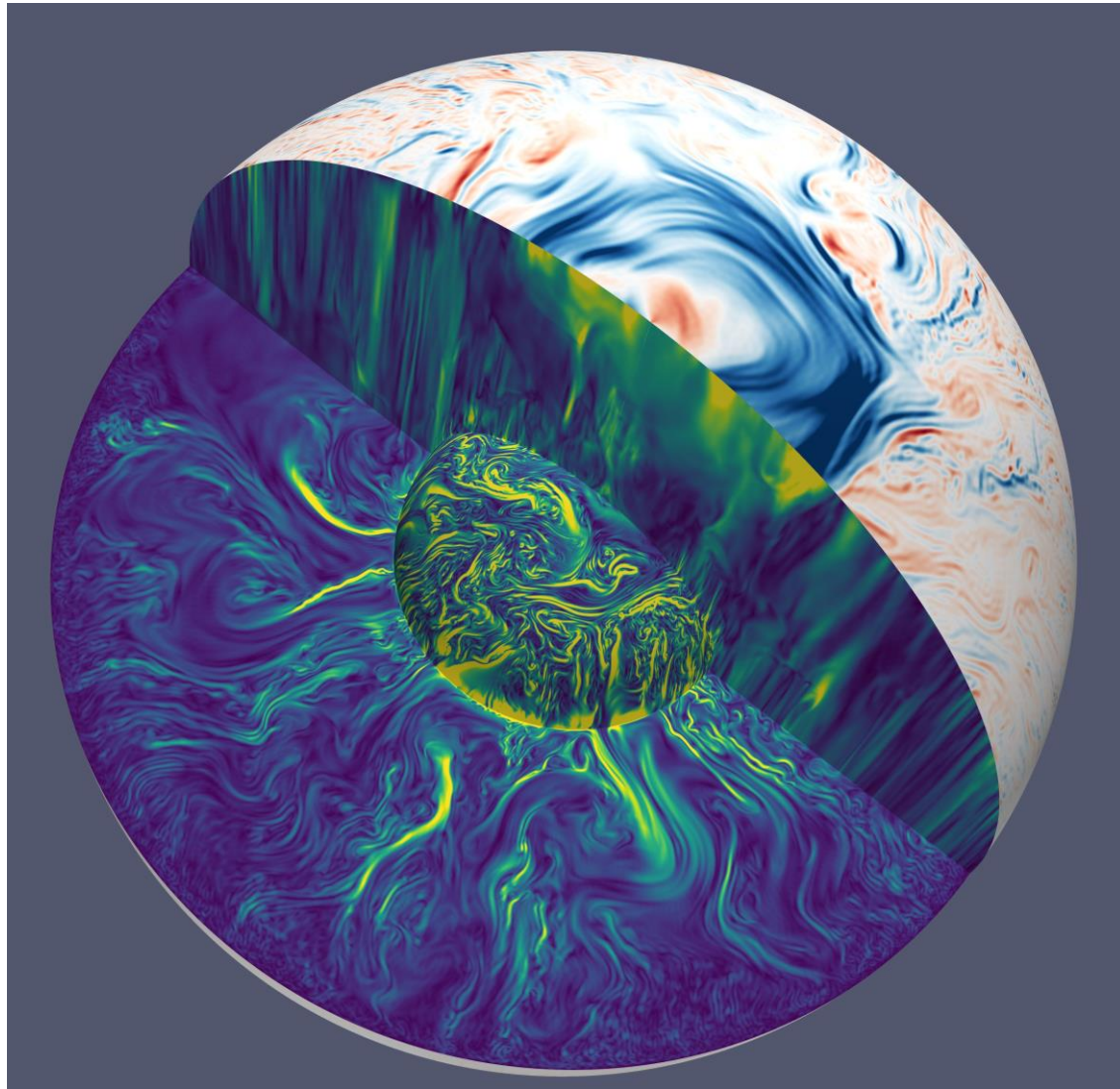
# Mineralogy & Geochemistry

## Deep hydrated mantle reservoir since 3.3 Ga



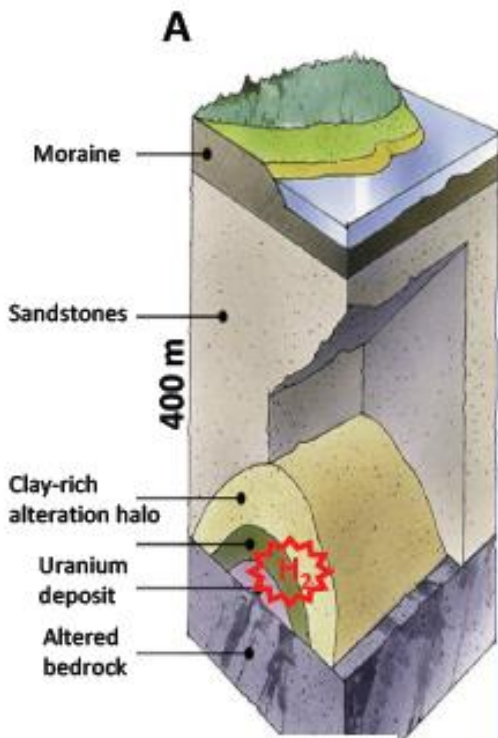
# Modeling flow into the Earth's core (**XSHELLS**)

azimuthal velocity (blue towards the west, red towards the east in sections, the intensity of the velocity)

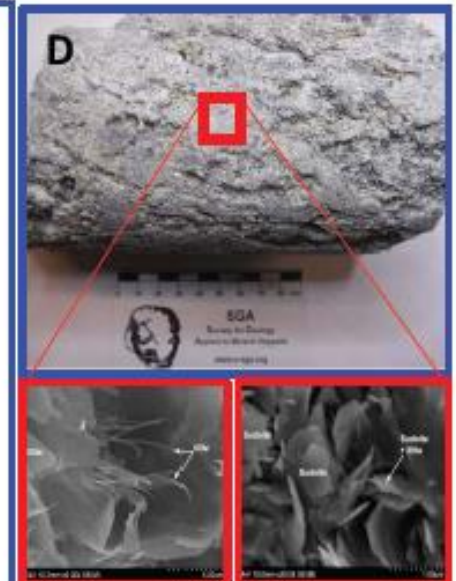
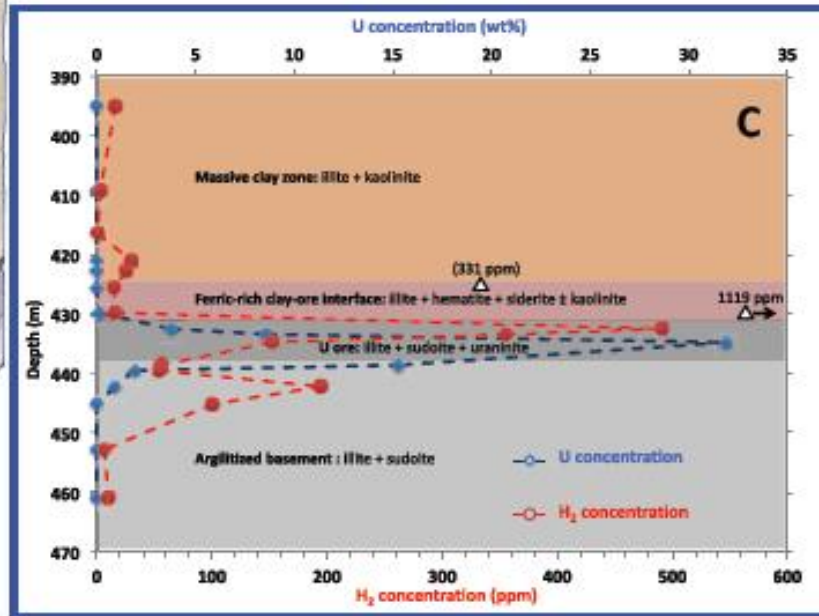
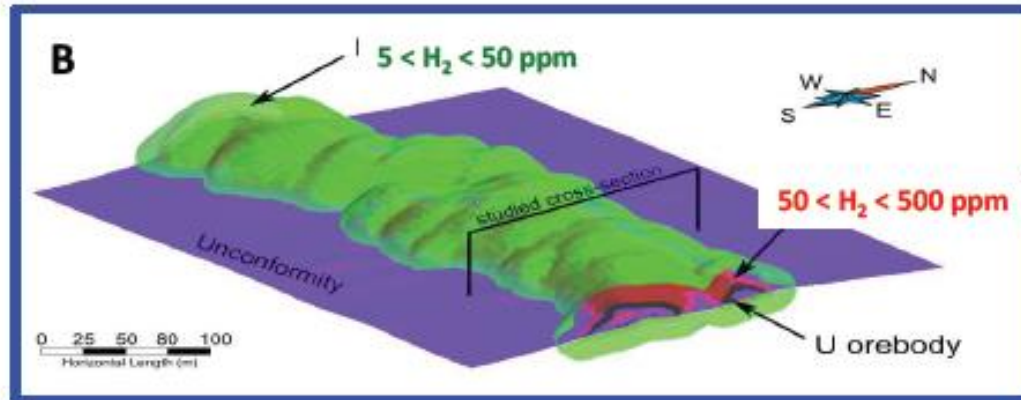




# H<sub>2</sub> sorption on Clay mineral surface

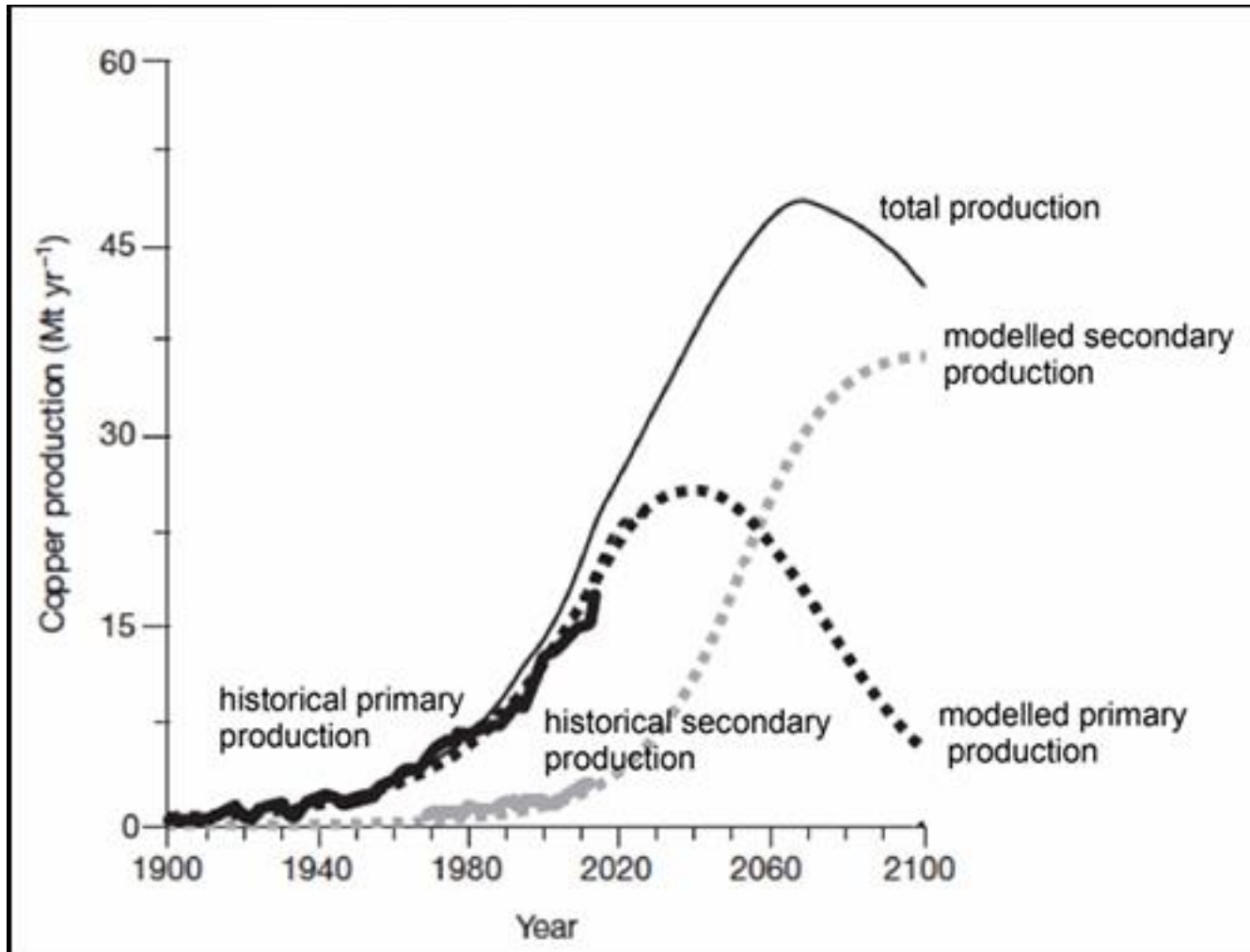


Cross section of the Cigar Lake U deposit, Athabasca, Canada

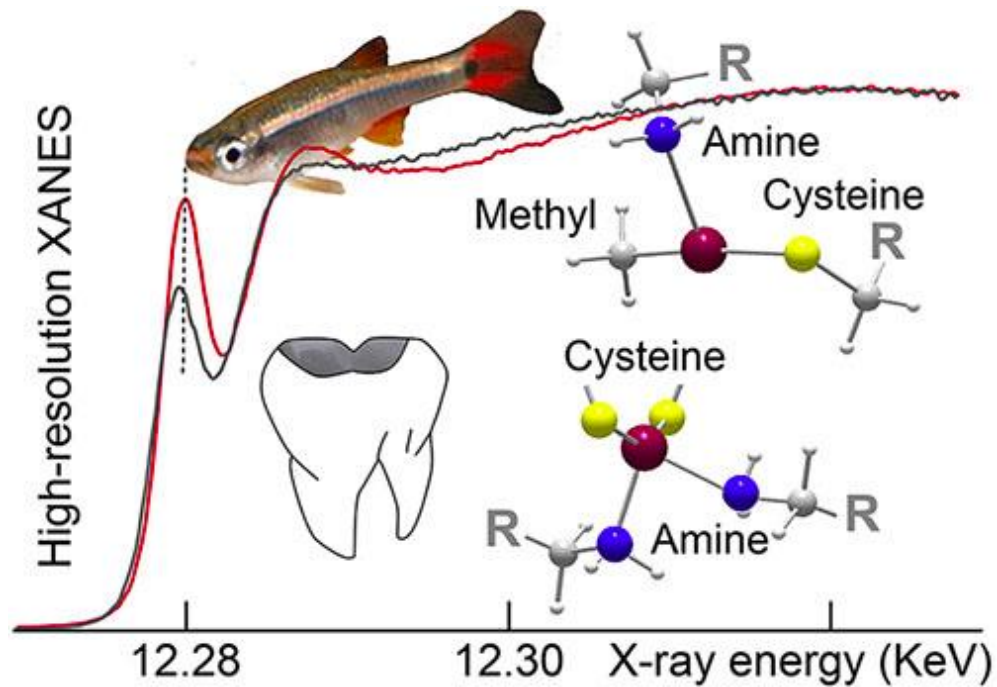


# Energy transition :

modeling the evolution of metal needs in the future



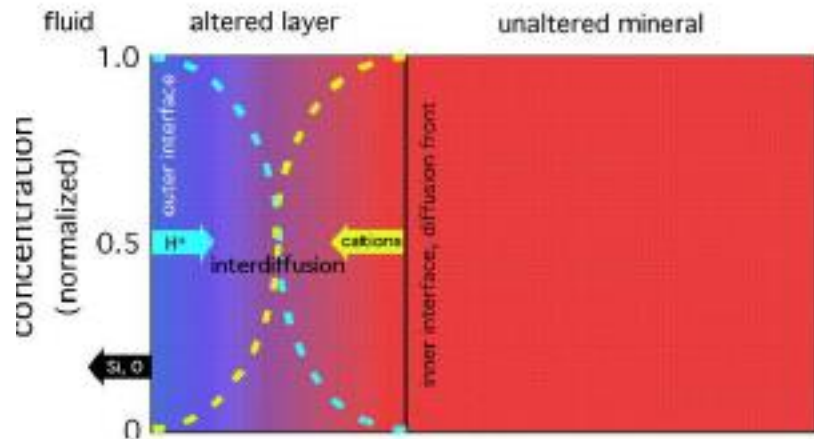
# New synchrotron beamline & modeling : High Resolution analysis of Mercury



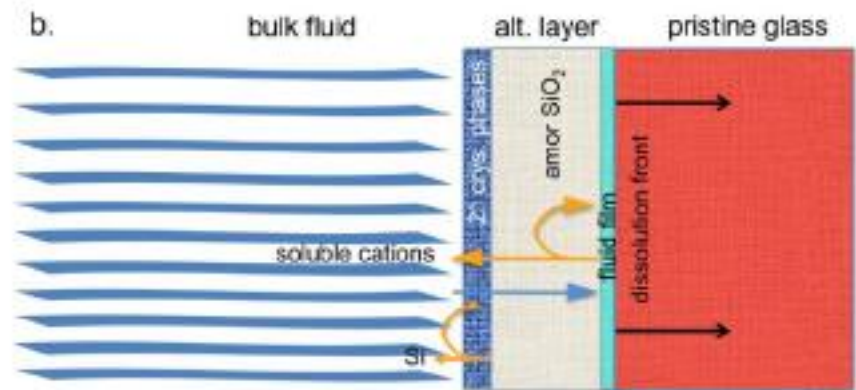
ECoX

# Crystal Growth : towards a new model

## traditional model: interdiffusion



## new model: coupled interfacial dissolution-precipitation (CIDR)



SWOT

# Strengths

- High quality of the research
- International visibility
- Attractiveness especially for young scientists
- Various financing supports (Europe, ANR, IDEX, Labex, CNRS, IRD, CNES etc.)
- Internal funding
- Formal association with several organisations (Tutelles) and strong links with CNES
- synergy with UGA computation and storage facilities, Synergy with ESRF
- Link with industry (Start-up, labcom, Contracts, Consortium)
- Outreach
- Efficiency of technical and administrative staff, services and platforms
- Collective management
- New amphitheatre, new technical Hall, new offices

# Opportunities

- 3IA project: strong link between data and computing
- Upgrade of the ESRF
- RESIF-EPOS and REGEF infrastructures
- The new integrated University
- IDEX, renewal of Labex OSUG@2020
- EUR and Risk Institute (Links to social sciences)
- AURORA environment (European university network)
- ERASMUS MONDUS Master and joint Master GeoRisks (UGA-Lebanon)
- « Startup spirit »
- Eco-responsibility of research activities

# Threats

- Lack of technical staff (lack of permanent positions, stabilisation of temp staff)
- Rapid and uneven growth (demography, building maintenance, management, equipment ..)
- Lack of space
- Uneven distribution of financial resources within the lab.
- Few PhDs' Doctoral School grant
- Possible disconnection between ISTerre Grenoble and ISTerre Chambéry (UGA vs USMB)
- Structural disconnection between Research (Pole, OSUG) and teaching ( Faculty)
- Too many administration tools
- Lack of funding for long-term fundamental research (except ERC)




# Weaknesses

- ITA ratio / researchers too low
  - Maintaining "traditional" sample processing technics
  - Support for computing
  - Support for analytics
  - Support for experiments
- Female/male ratio too low
- Lack of structures for arriving post-docs
- Distance between ISTERre Grenoble and ISTERre Chambéry
- Weak communication between Research and Teaching
- Weak communication between researchers and ITA at the time of project writing
- Aging building, electrical problem, thermal insulation, windows (Grenoble and Chambéry)
- carbon footprint on travel



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