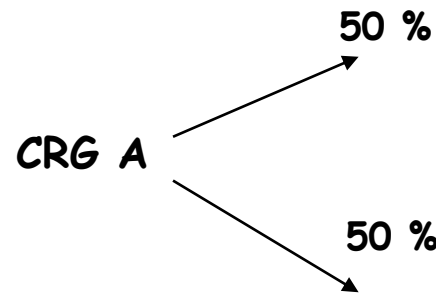


The High Energy Resolution Backscattering Spectrometer IN13



- Present contract: 2016-2020
- Responsible: F. Natali & J. Peters
- Technician (since sept. 2017): B. Gervasoni

BEAM TIME ALLOCATION



STAFF CURRENTLY WORKING ON IN13



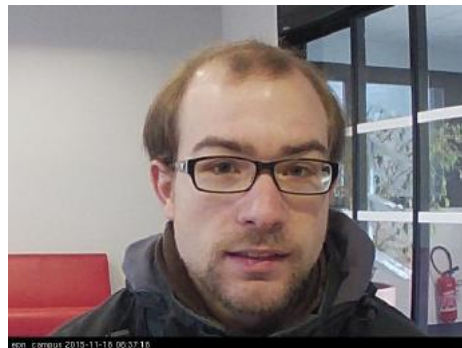
F. NATALI
(CNR-IOM)
SCIENTIST



J. PETERS
(U.J.F., Grenoble)
PROFESSOR



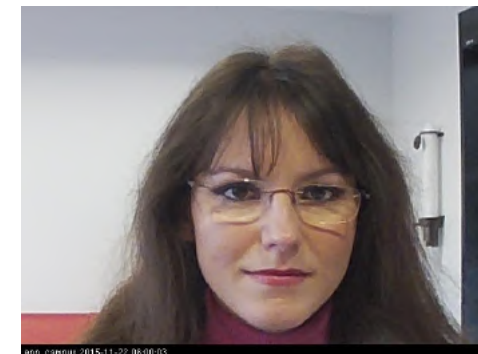
B. GERVASONI
Technician
(UJA, Grenoble)
Septembre 2017 -



D. ZELLER
PhD student
(U.J.A. - ISIS)
Janvier 2016 -

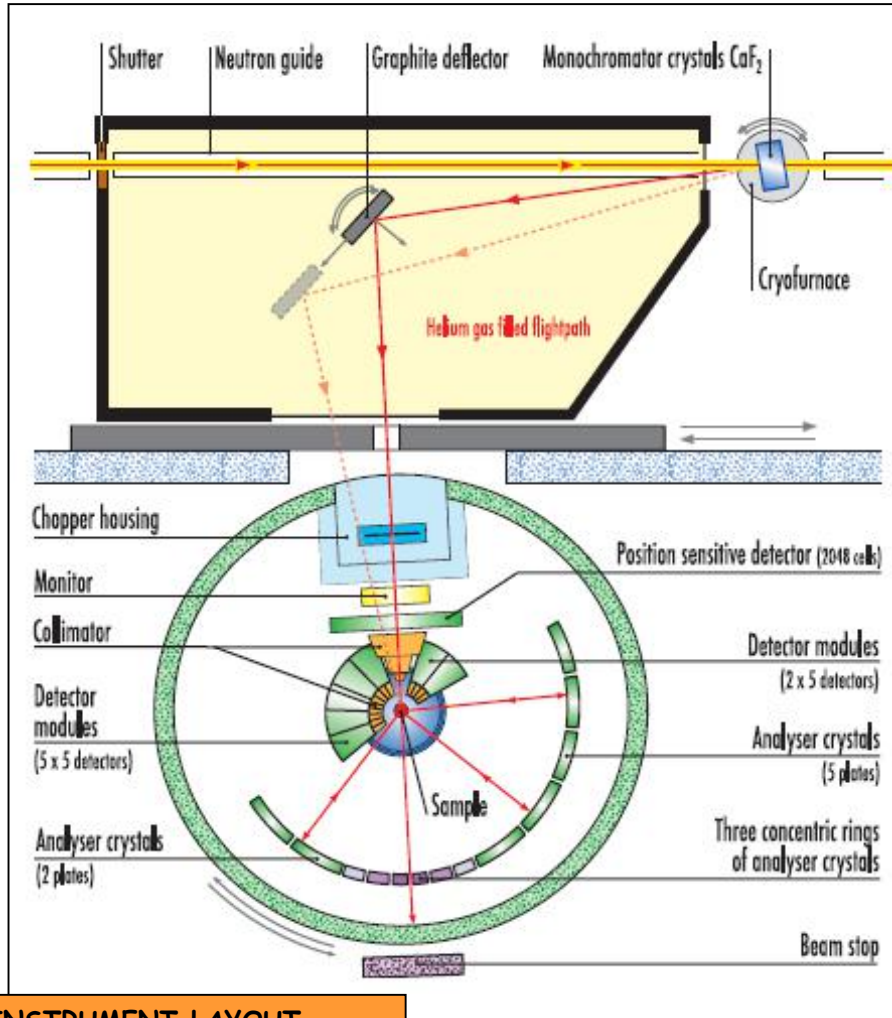


L. MISURACA
PhD student
(U.J.A.)
November 2017 -



I. PIAZZA
PhD student
(ILL & University of Palermo)
Janvier 2015 -

TECHNICAL FEATURES



INSTRUMENT LAYOUT

Backscattering spectrometer IN13

$\Delta E \sim (8 \text{ meV FWHM})$ - High Q ($0.3 < Q < 4.9 \text{ \AA}^{-1}$)

Unique spectrometer with such a Q range accessible worldwide

time $\approx 100 \text{ ps}$ \rightarrow corresponding to internal dynamics of macromolecules, but not to water diffusion and macro-molecular translations.

- Only 1 reactor cycle available, January-March (48 days)
- 6 experiments performed (2 ILL, 14 days, and 4 CRG, 24 days)
- 14 scientific papers published
- NO days lost!

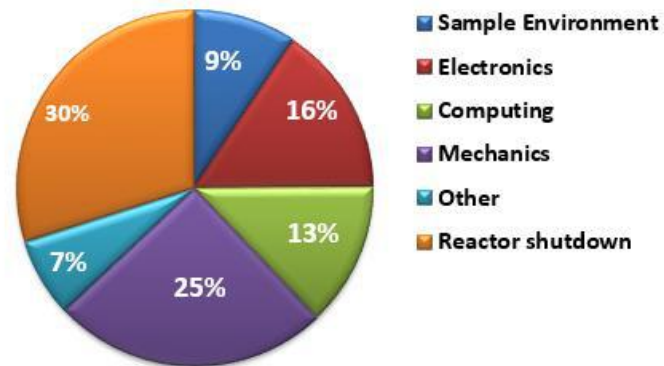
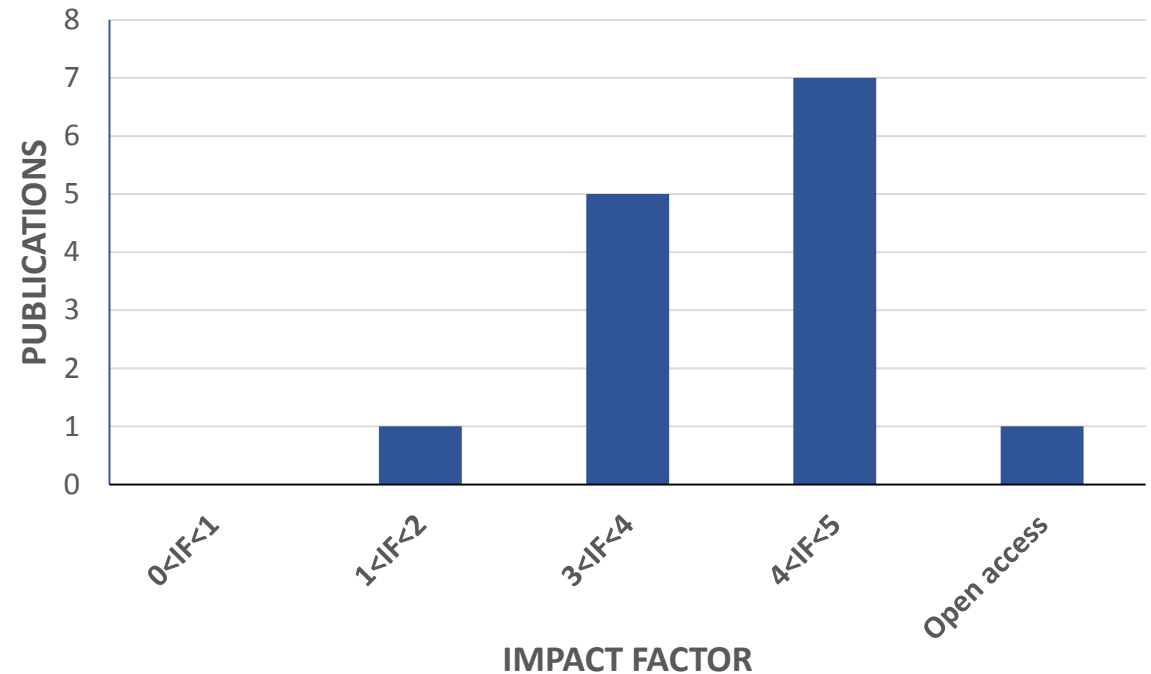
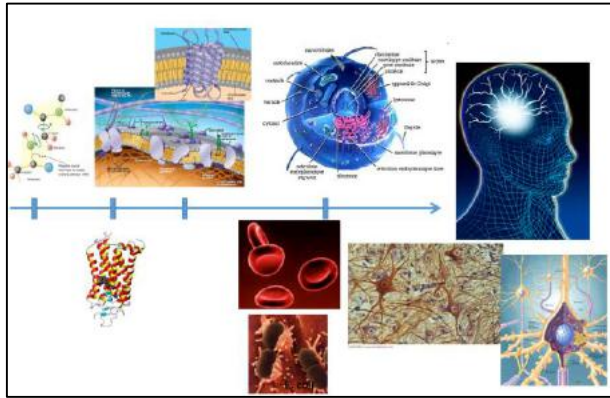


Fig.8: Repartition of the technical problems occurred during 2011-2015 over the different ILL services

2010-2015:
 Only ~ 16 days were lost over 758 available days (i.e. ~ 2.0%)



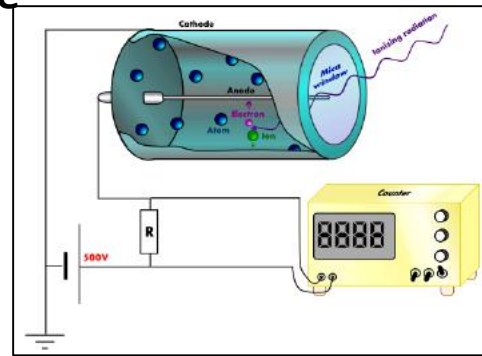
Fields of investigation



Biology-Medicine

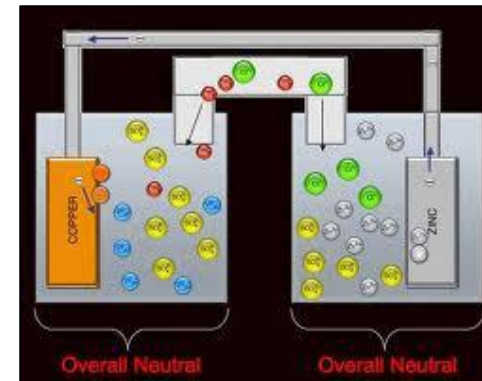


Liquids

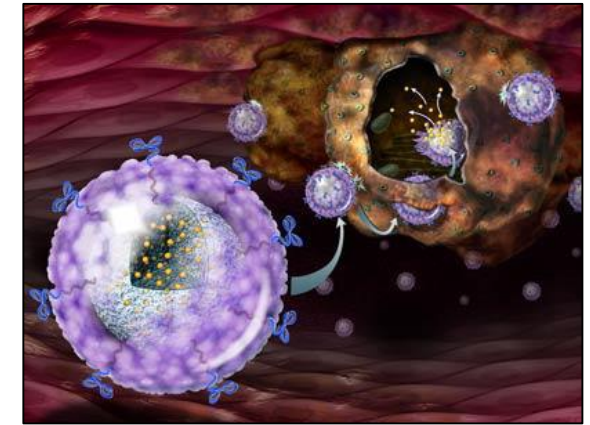


Detectors

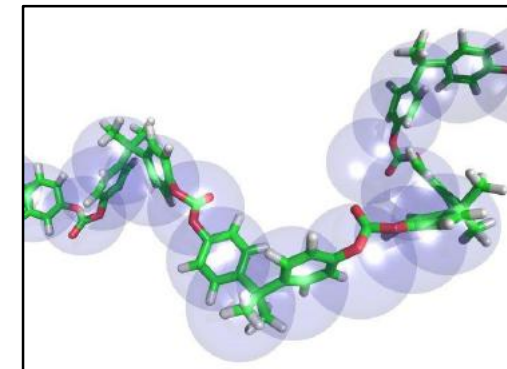
Cultural heritage



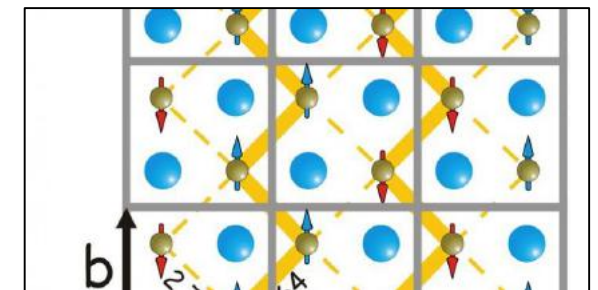
Energy



Pharmaceutics



Polymers



Magnetism

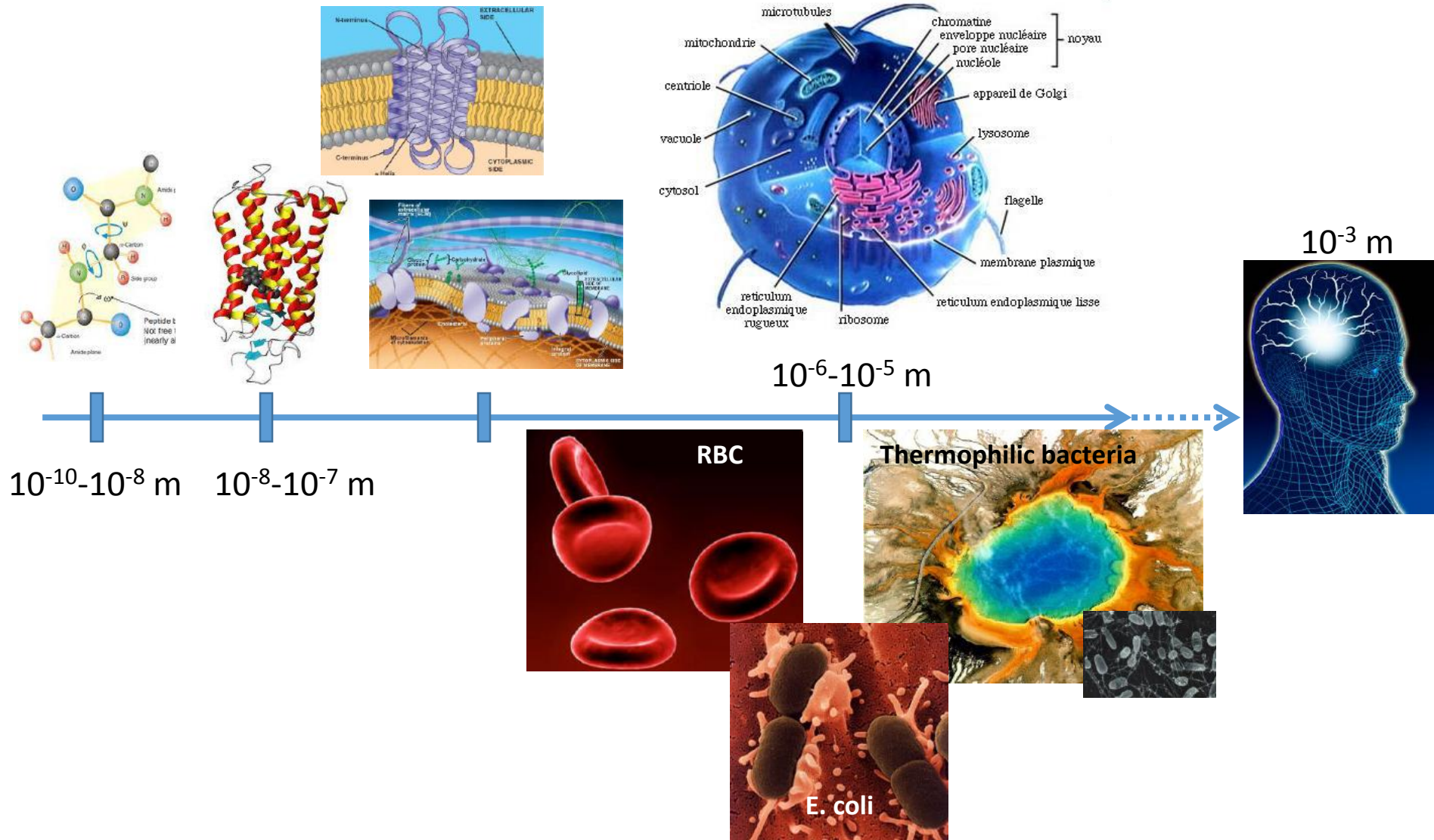
...and more!

Study of internal dynamics of biological macromolecules in solution, powder or cell samples
Applications are found in: biology, medical science, chemistry, physics, cultural heritage, ...



Software

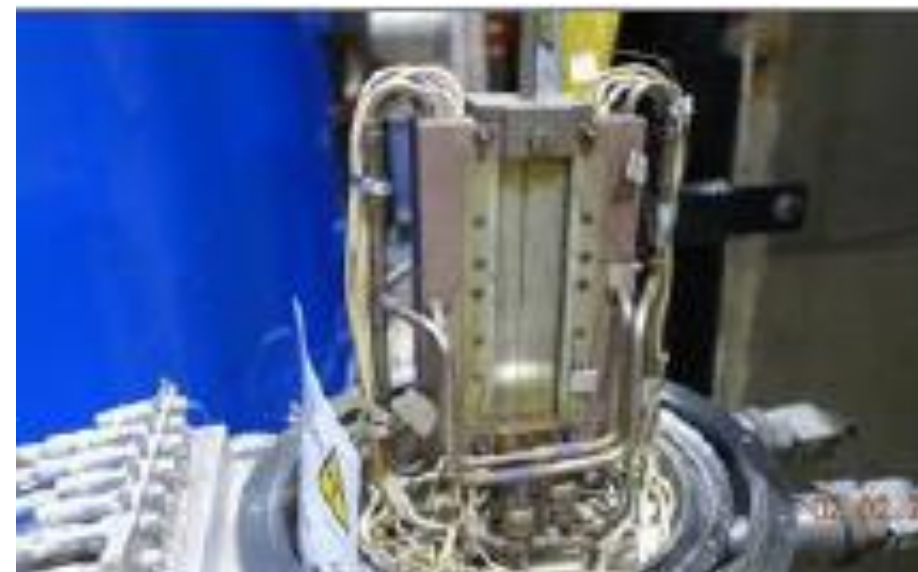
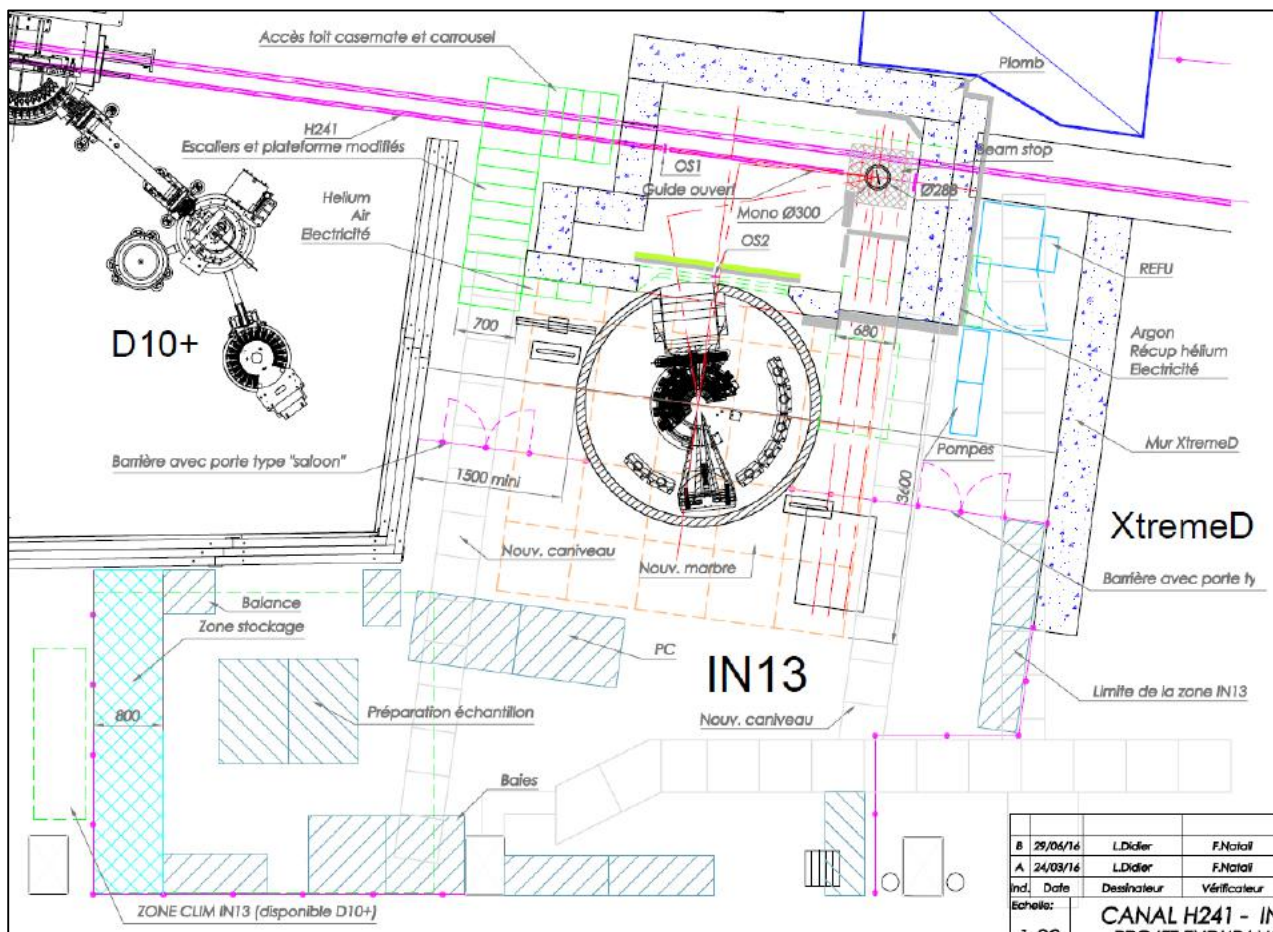
PROTON DYNAMICS IN BIOLOGY: A SOPHISTICATED SCENARIO REVEALED BY NEUTRON SCATTERING



IN13 + under the Endurance Program

Sub-project n.1 Relocalisation of IN13 on new H241A guide

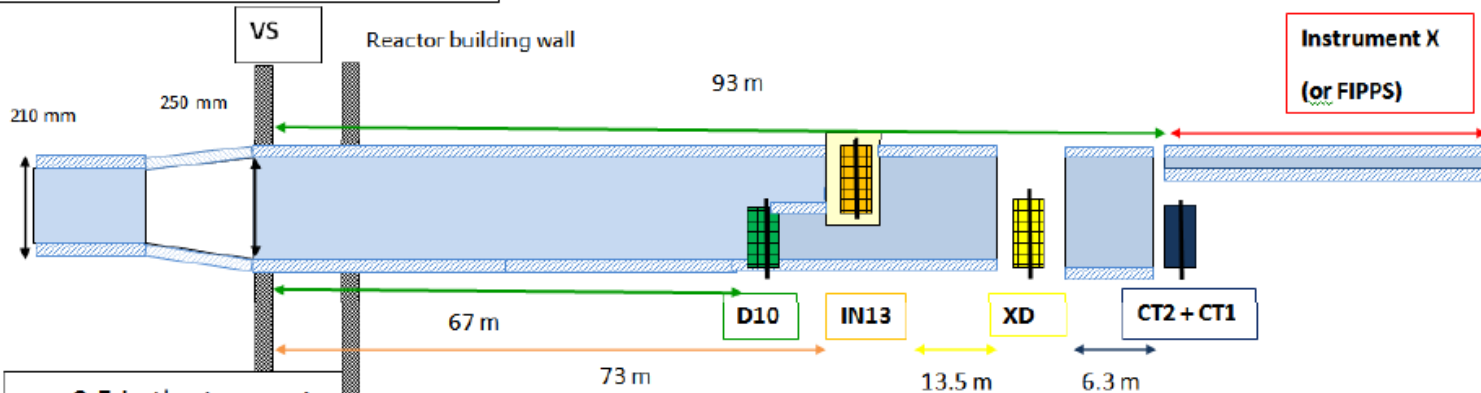
Sub-project n.2 T gradient monochromator



Estimated Budget (Sep. 2017): 343 k€

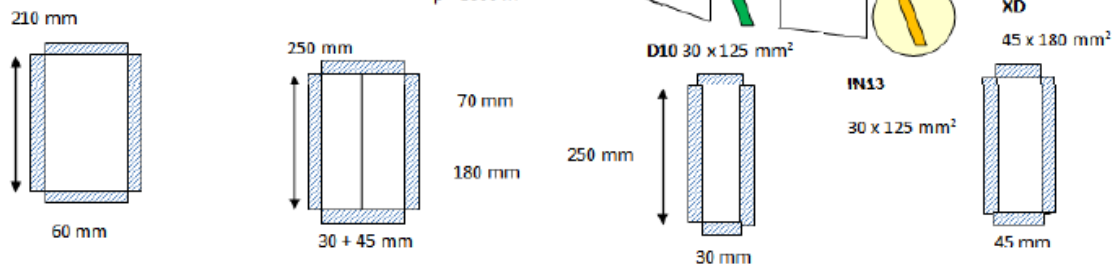
Estimated Budget (Sep. 2017): 401 k€

$m = 3$ for in pile guides

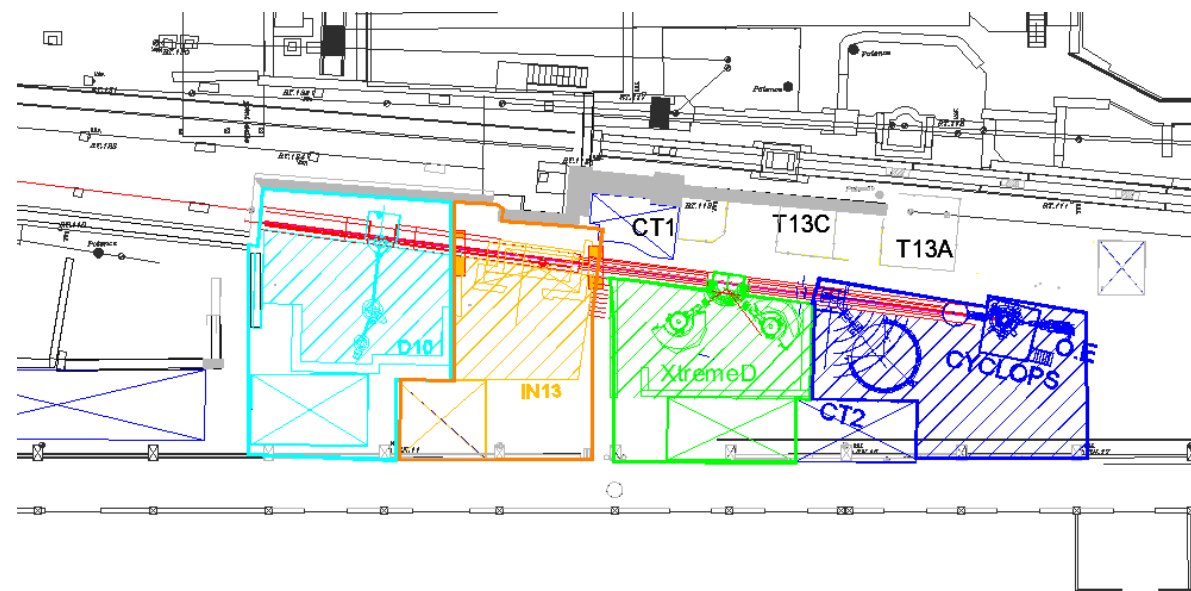


$m = 2.5$ in the trumpet

$m = 2$ for all out of pile guides



Guide coating	Flux at guide exit s ⁻¹	Gain factor at sample	Incident Resolution $d\lambda/\lambda$
All sides m=1	2.98 x 10 ⁹	1	1 x 10 ⁻⁴
Sides m=1, top/bottom m=2	5.18 x 10 ⁹	1.7	1 x 10 ⁻⁴
All sides m=2	8.24 x 10 ⁹	2.5	2 x 10 ⁻⁴



Sub project n. 2

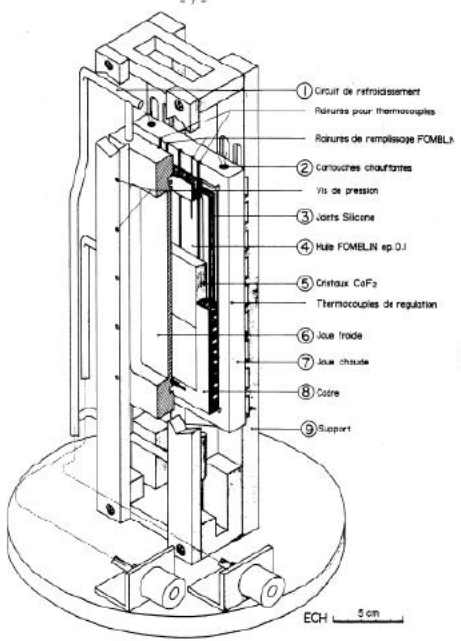
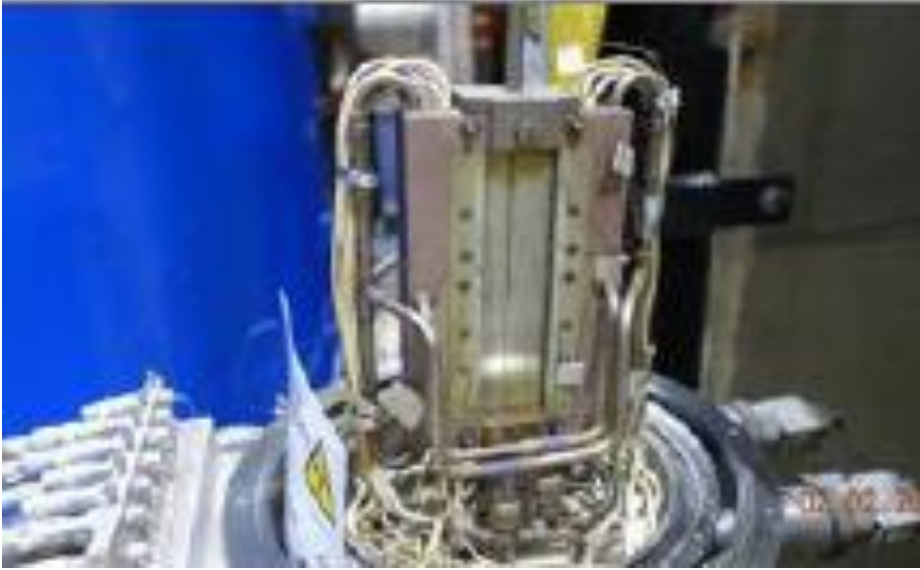


Fig. 10: Technical design of the temperature gradient monochromator realized by Heidemann et al, in 1980.

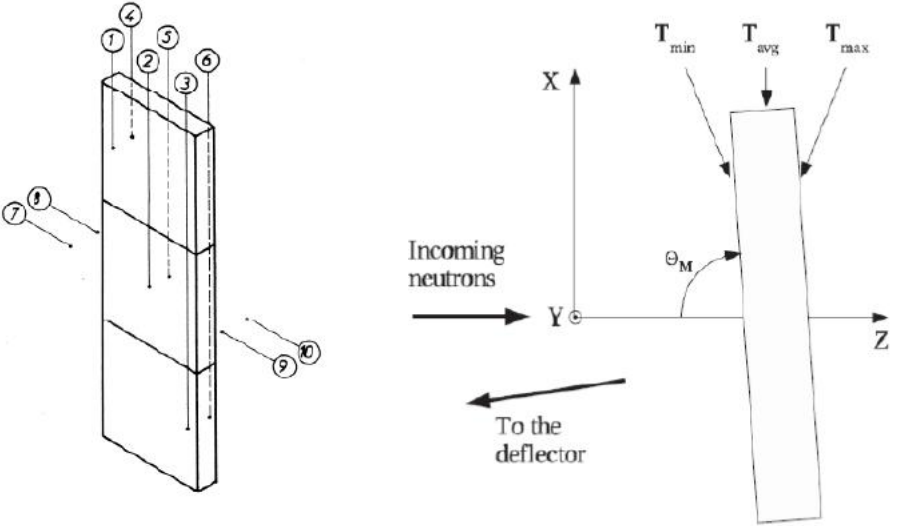


Fig. 11: schematic representation of the local arrangement of the set of thermocouples.

