



JUNO at FERRARA



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Consiglio di Sezione - INFN Ferrara

1 luglio 2022

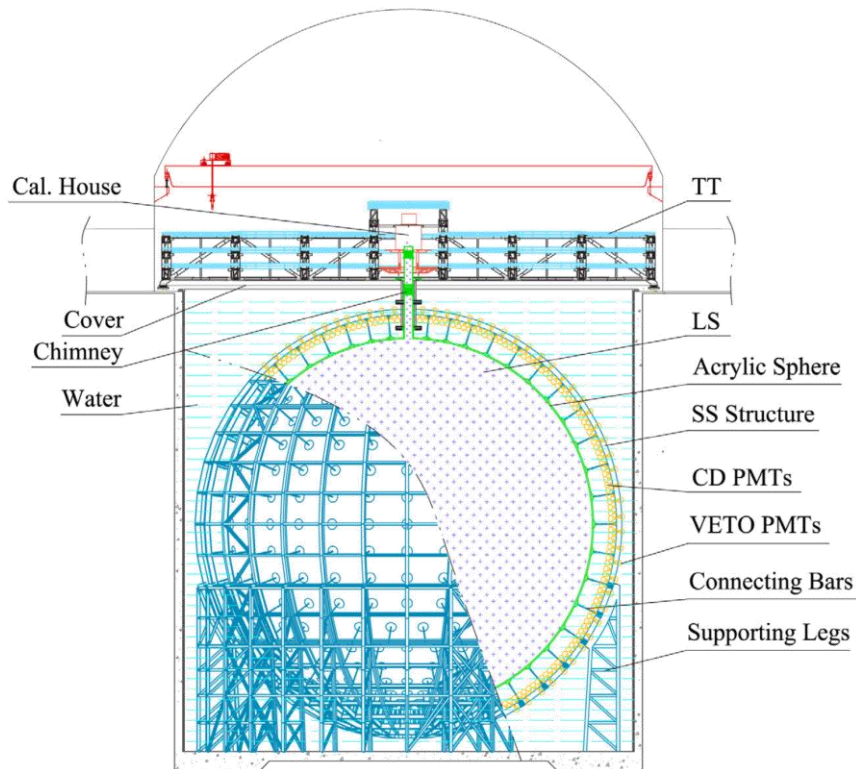
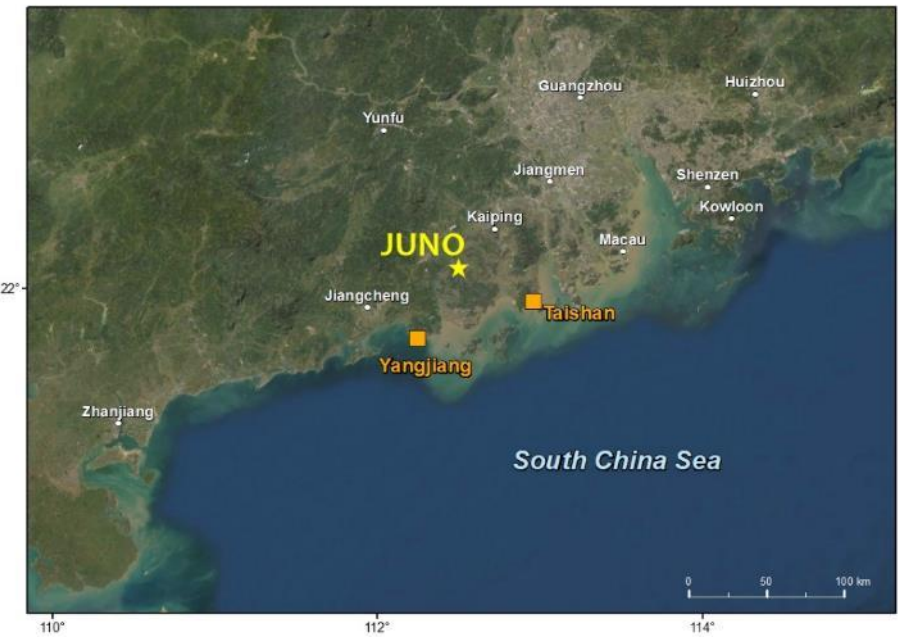
JUNO: status

JUNO: a multi-purpose underground 20 kton liquid scintillator detector
(Guangdong province, China)

Goals: neutrino mass hierarchy, precision measurement of neutrino oscillation parameters, supernova neutrinos, geoneutrinos, atmospheric neutrinos, solar neutrinos

Sezioni INFN: CT, FE, PD, RM3, LNF, MIBI, MI, PG, CT

Roadmap dell'esperimento: 01/12/2023 – Start test run



Progress in Particle and Nuclear Physics 123 (2022) 103927

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)



Progress in Particle and Nuclear Physics

journal homepage: www.elsevier.com/locate/ppnp



Review

JUNO physics and detector

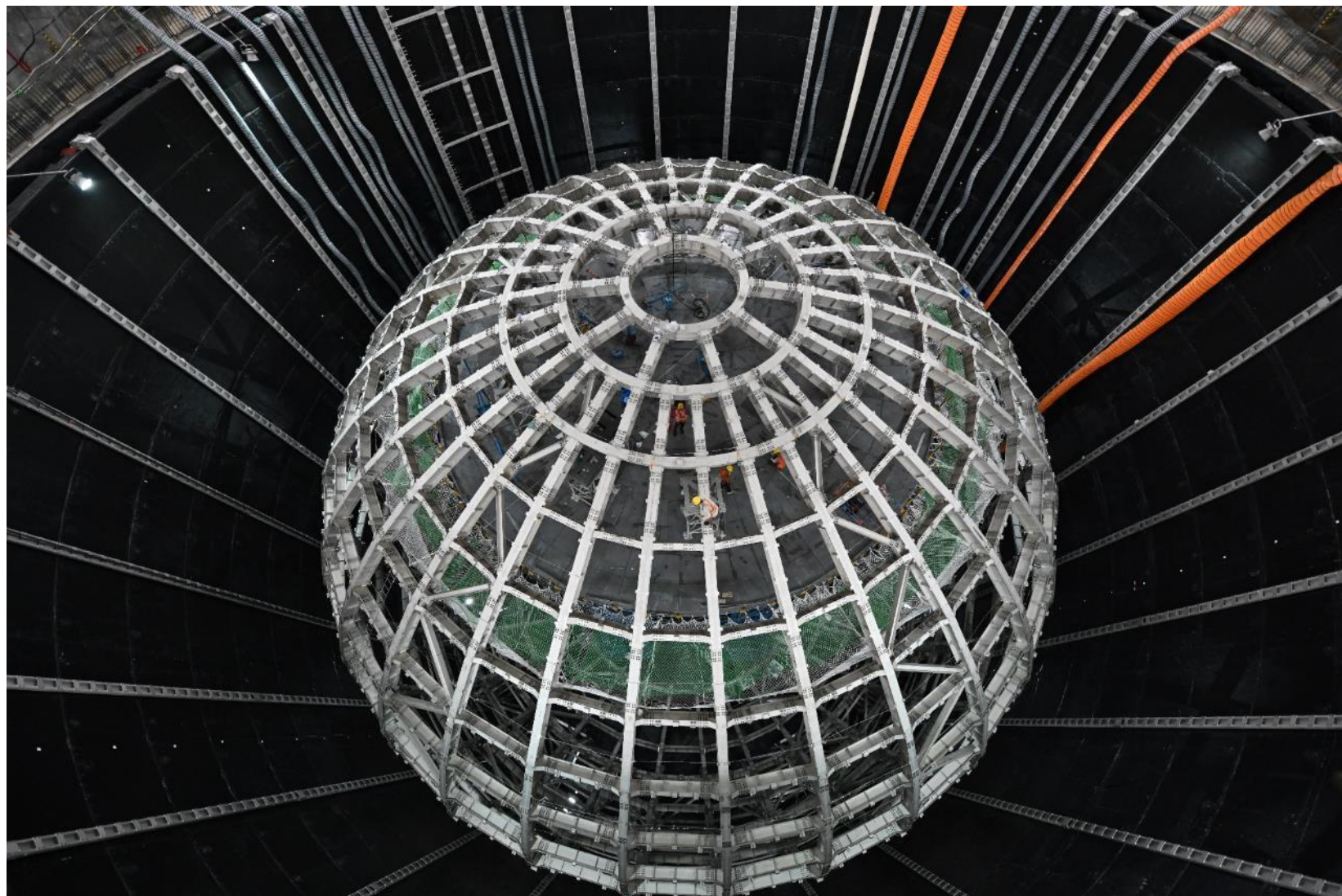
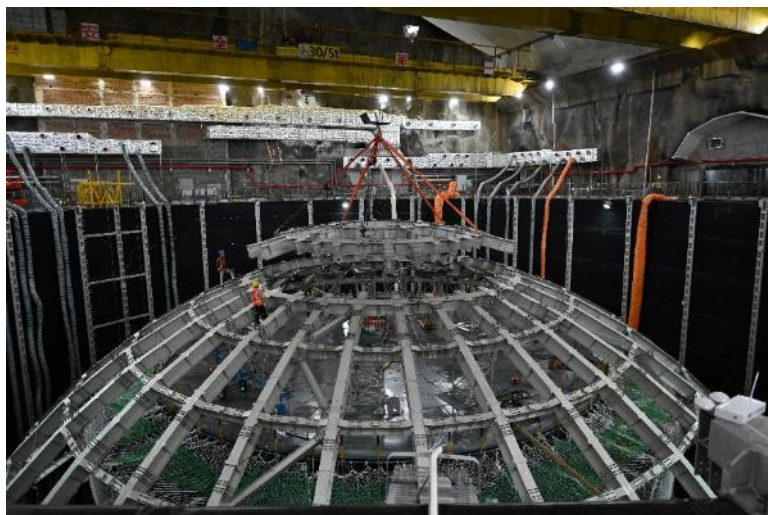
JUNO Collaboration¹



JUNO: infrastrutture esterne



Stainless Steel Truss

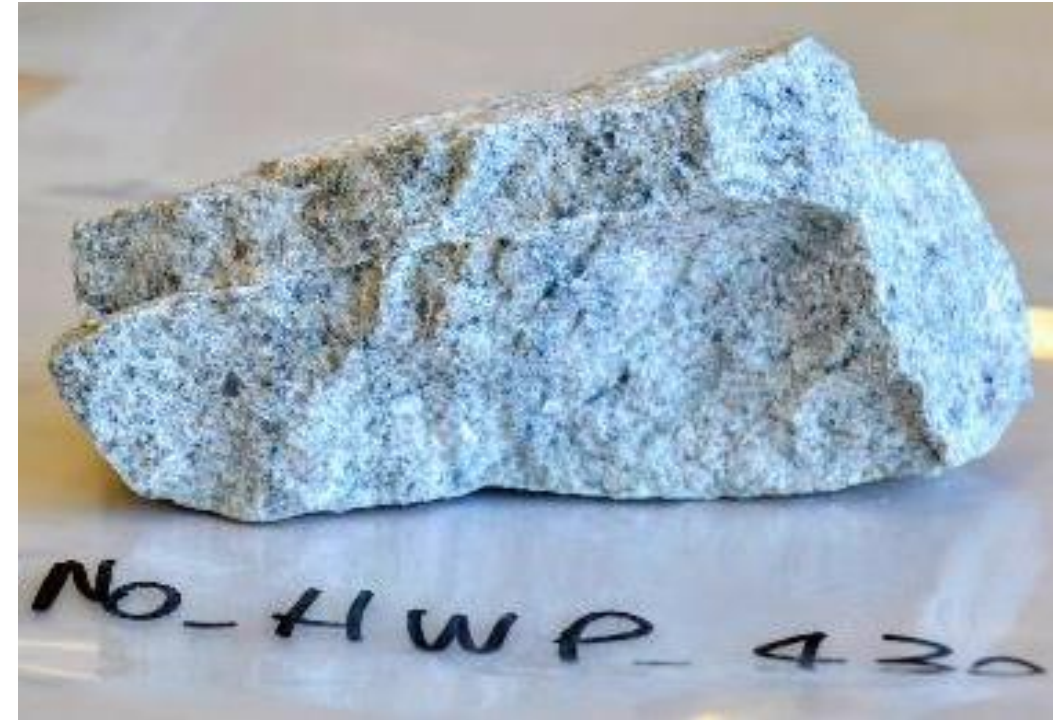


Main activities at Ferrara



Designing, realizing and testing the **distillation and stripping plants** for JUNO liquid scintillator in collaboration with Polaris company

Geophysical and geochemical inputs for modeling reactor antineutrinos and geoneutrino signal in JUNO



Construction of distillation and stripping plants

- The radio impurities in the Liquid Scintillator are one of the main source of signal background.
- **Distillation:** removal of the heaviest radio-impurities (U, Th, K)
- **Stripping:** removal of gaseous radio-impurities (Ar, Kr, Rn)
- **Ferrara's contribution:** design, realization, test and installation of the plants on site.



Distillation:

- Shipped: 10 November 2020
- Delivered: 24 December 2020

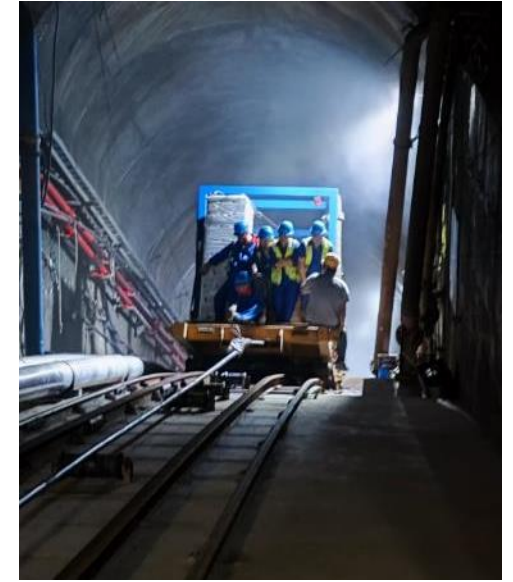
Stripping :

- Shipped: 29 July 2020
- Delivered: 01 October 2020



Installation of the distillation and stripping plants

Distillation



Stripping



Characterization of the JUNO site

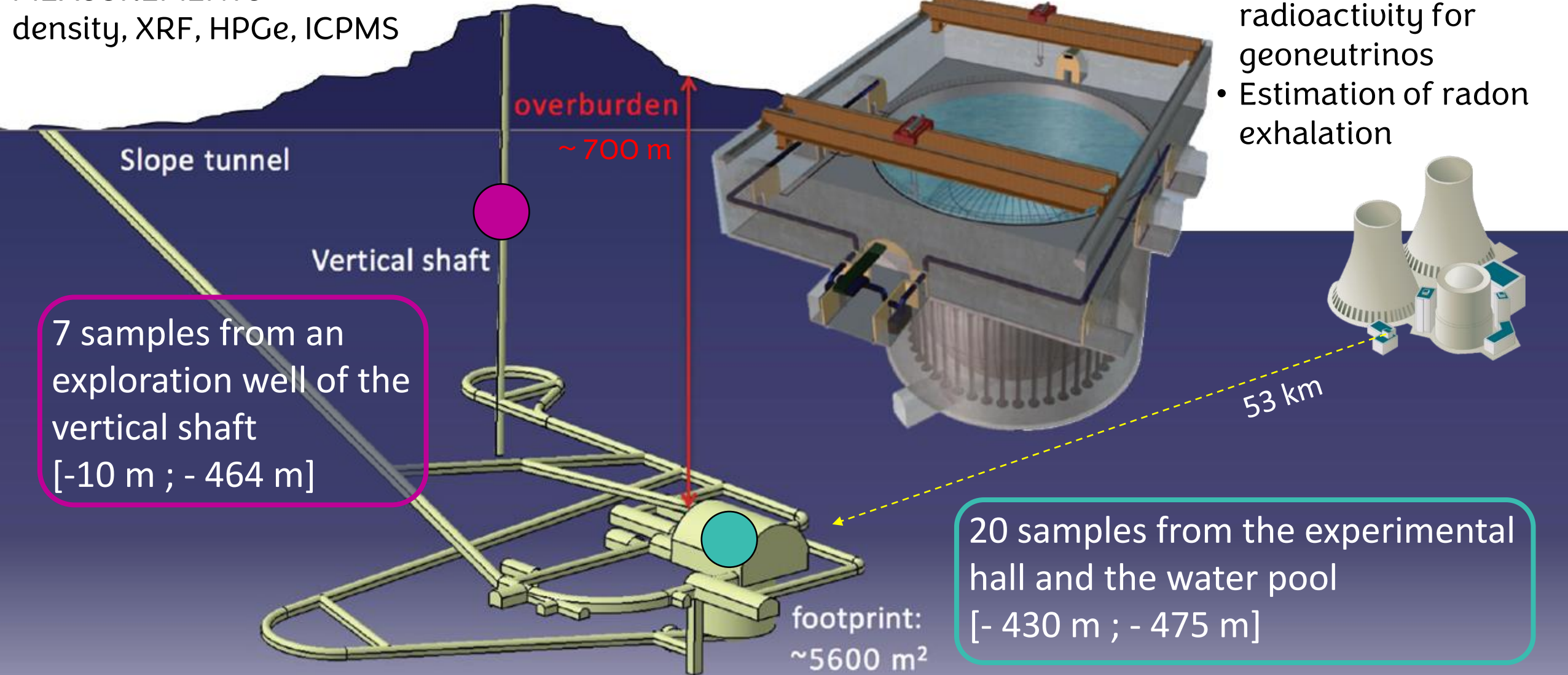
TOTAL NUMBER OF SAMPLES: 27

TYPE OF ROCK: GRANITES

MEASUREMENTS:

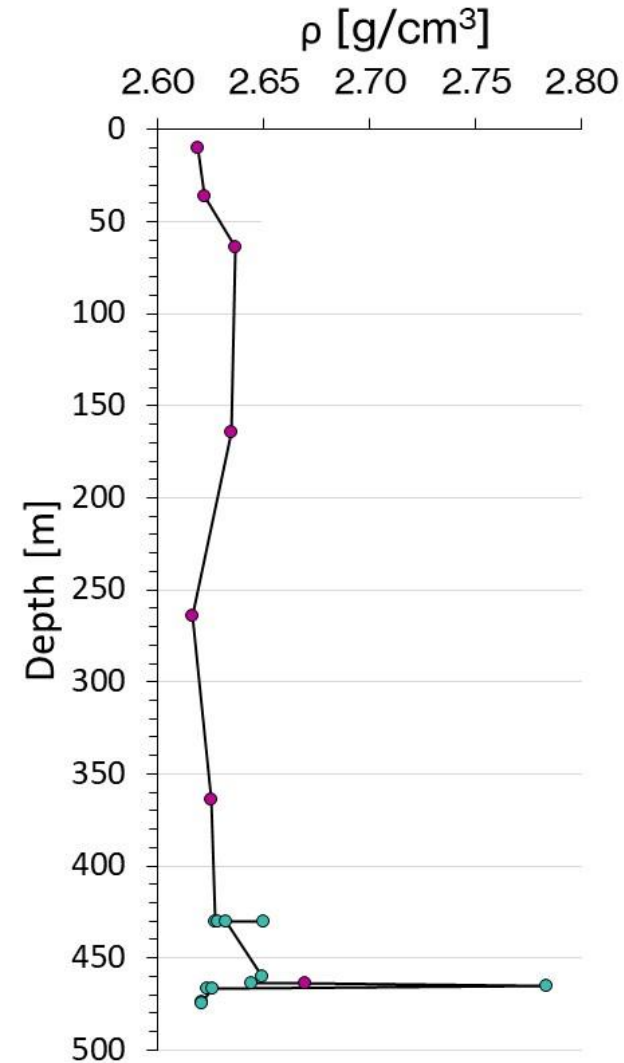
density, XRF, HPGe, ICPMS

- Survival probability modeling
- Reconstruction of muon cosmic flux.
 - Study of natural radioactivity for geoneutrinos
 - Estimation of radon exhalation

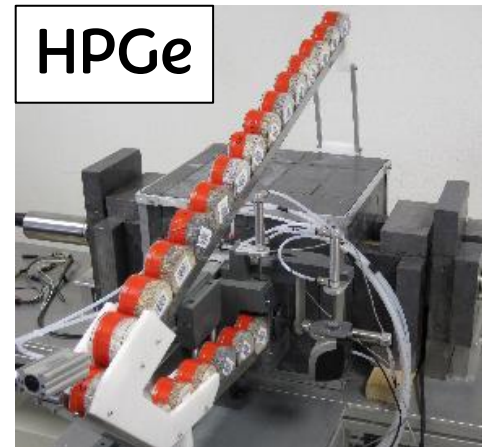
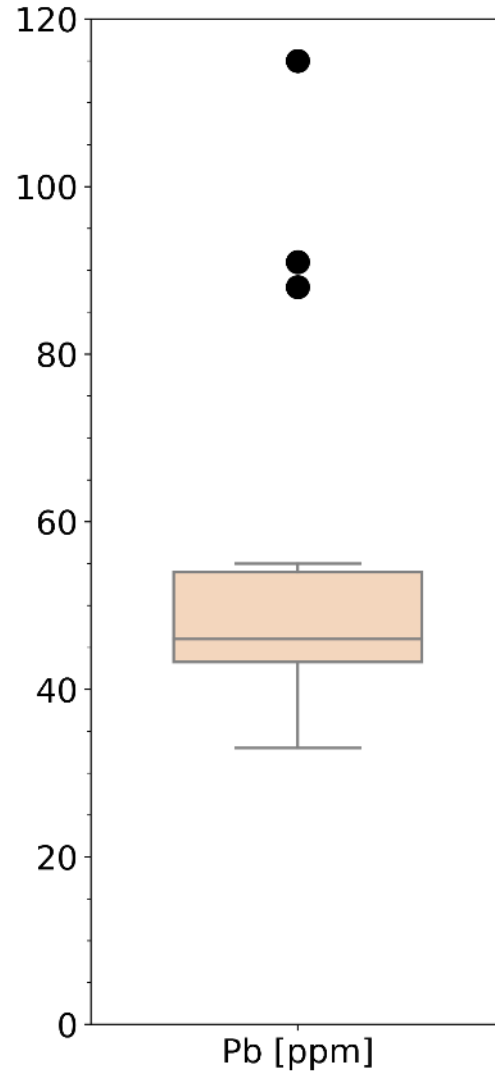


Geophysical and geochemical inputs

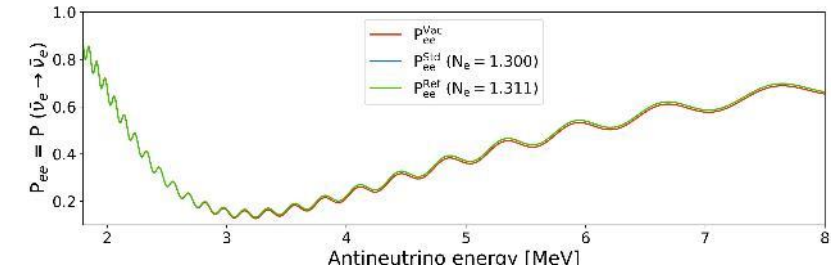
DENSITY



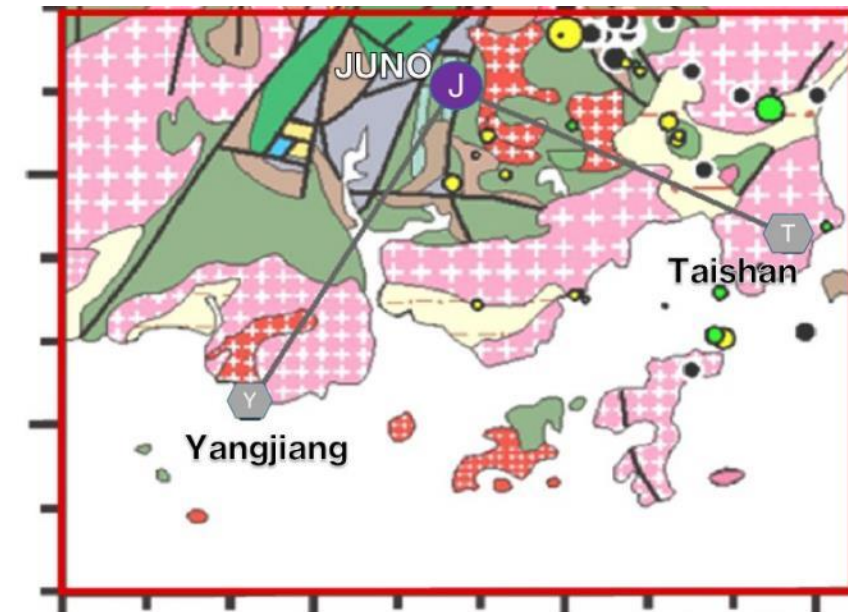
CHEMICAL COMPOSITION



MATTER EFFECT ON SURVIVAL PROBABILITY



GEOLOGICAL MAP



JUNO @ Ferrara 2023

PRELIMINARY



Previsioni di spesa (k€)	
Missioni	25
Inventario	23
Consumi	7
Software	7

Persone		
Cognome	Nome	FTE
Albèri	Matteo	1.0
Maino	Andrea	1.0
Mantovani	Fabio	0.8
Montuschi	Michele	1.0
Ricci	Barbara	0.4
Strati	Virginia	1.0
Totale		5.4



JUNO EU + Americas meeting at FERRARA



24-28 ottobre 2022

