



Elettra Sincrotrone Trieste

From Elettra to Elettra 2.0

Marco Peloi

Head of the Industrial Liaison Office

Elettra Sincrotrone Trieste

Marco.peloi@elettra.eu

A 4th generation light source that will replace the existing 3rd generation light source.

Elettra is serving since 30 years the user community with excellent results.

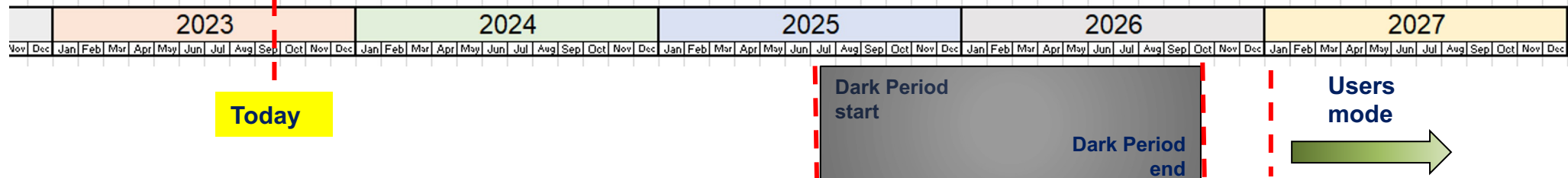
To keep the light source competitive for synchrotron research and enable new science and new technology developments, the diffraction limited storage ring Elettra 2.0 is going to replace Elettra.



Elettra Sincrotrone Trieste
1993 - 2023 | 30 years of light



Elettra 2.0 Timeplan



PHASE 1 (*all beamlines in operation*)

Main activities:

- Start upgrade of the Beamline Control System
- Start upgrade of the photon transport optics wherever possible
- Upgrade of the safety hutches
- Installation of safety hutches for SYRMEP-LS and HF-SAXS (space already available)
- Removal of SR-FEL, LILIT and IUVS BLs
- Adjustment of the tunnel wall where possible

PHASE 2

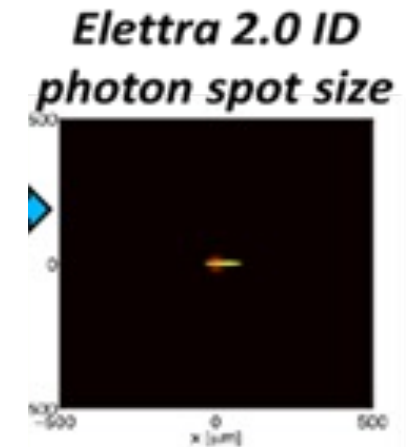
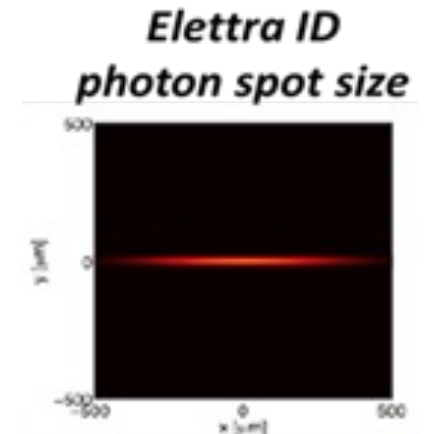
- Installation of most of the new beamlines
- Upgrade of the liquid nitrogen distribution plant
- Completion of the tunnel wall adjustment

PHASE 3

- Installation/upgrade of the remaining beamlines

From Elettra to Elettra 2.0

| | | Elettra | Elettra 2.0 |
|--|---------------|--|---|
| Operating for users | | 1994-2025 | 2027- |
| Beam energy | GeV | 2.4 (25%) --- 2.0 (75%) | 2.4 GeV (2.0 for some time) |
| Photon energies | keV | 0.003-25 | 0.015 - 60 |
| e – emittance - coupling | nm-rad | 10 --- 7 - 1% | 0.212 --- 0.150 - 3% |
| ID slots | | 11 Long + 1 short | 11 Long + 5 short |
| Beam lines (IDs, Dipoles) | # | 28 (19, 9) | 32 (25 ₃ IVU, 7 ₃ SB) |
| e-beam size at LS (σ_x, σ_y) | μm | 286,16 | 36,6 |
| Brilliance (ph/s/mm ² /mrad ² /0.1%bw) | | 2×10^{19} | 10^{22} |
| Coherence ratio at 1 keV | % | 0.5 | 30 |
| e - intensity | mA | 160 --- 310 | 400 |
| Lattice -symmetry | | 2BA - 12 fold | S6BA-E(nhanced)-12 fold |
| Fill patterns | | multi-bunch, single or few bunch, hybrid | whatever |



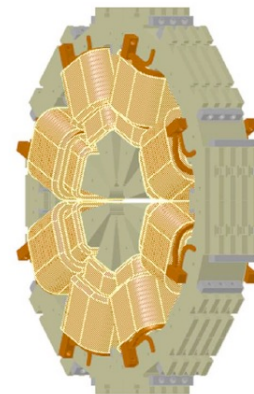
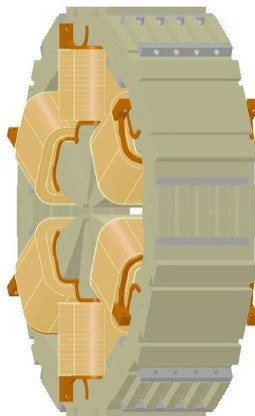
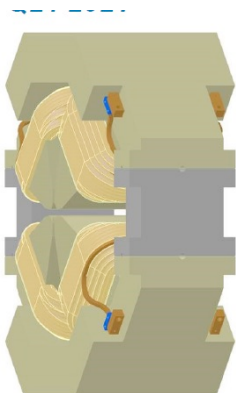
The configuration of Elettra 2.0 is based on an **enhanced symmetric six-bend achromat (S6BA-E)**.

Magnets

All magnets (552):

- water-cooled
- independently powered
- Correctors 24 + coils in multipoles
- Call for tender for Multipoles concluded
- Call for tender Dipoles closed-> administration phase

The purchasing procedures are underway





Power Supplies Update

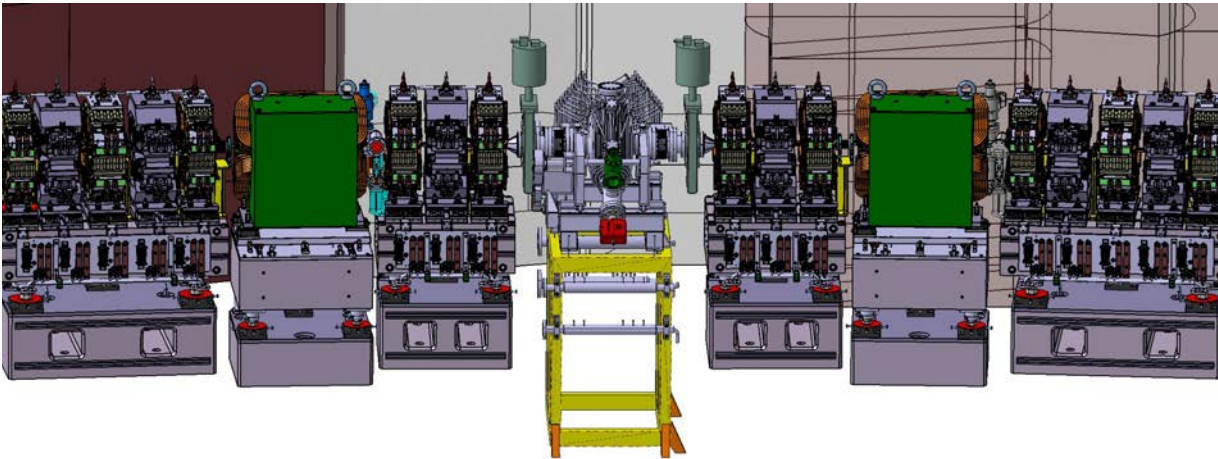
- ✓ **300 A unipolar units:**
 - 72 units (without spares)
 - **COTS (Commercial Off The Shelf)**
- ✓ **100 A bipolar units:**
 - 504 units (without spares)
 - **In-House design**
 - Commercial controller
 - COTS Aux and Bulk power supplies
 - In-house designed power board and sub-rack (2U high)
 - First power board prototype under test, second prototype is ready

- ✓ **20 A bipolar units:**
 - 456 (without spares)
 - 192 more units for Fast Correctors
 - **In-House design**
 - Commercial controller
 - COTS Aux and Bulk power supplies
 - In-house designed power board and sub-rack (1U high)
 - Two prototypes built and running
- ✓ Built-to-print Procurement strategy
 - One single purchase procedure

The purchasing procedures are underway

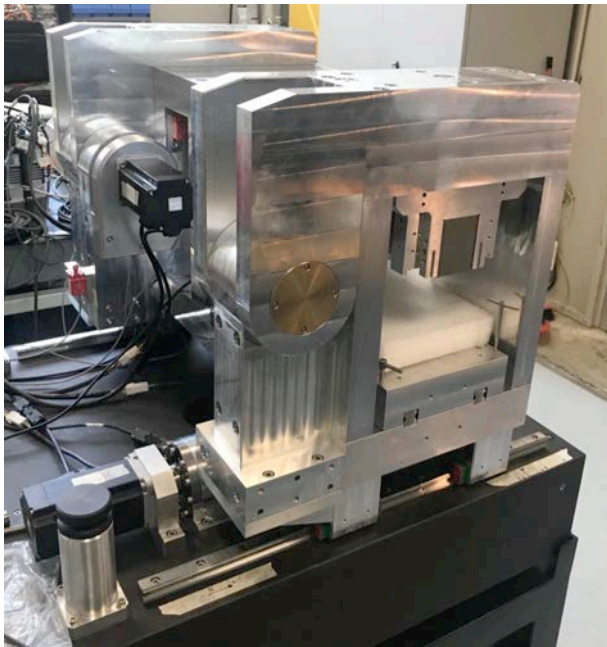
Elettra uses 4 rf single cell cavities that will also be used in Elettra 2.0 and 4 rf plants , 3 with klystrons and 1 with IOT replaced by Solid State CRE-331M 130 kW – 500 MHz amplifier.

All 4 klystron/IOT plants have been already replaced. For the double IOT amplifier one part will be reused later in the booster to provide the 1 MV needed voltage.

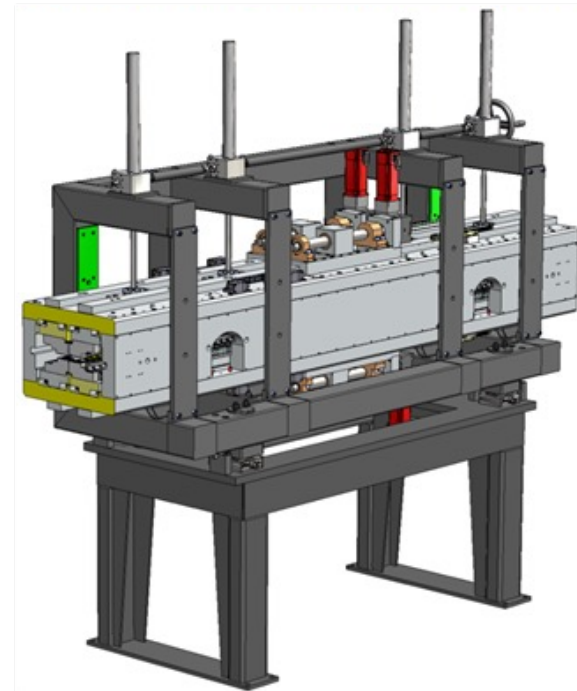


There are plans after 2028 to replace also the cavities with a more modern design equipped with HOM dumpers

1.8 T short wiggler prototype

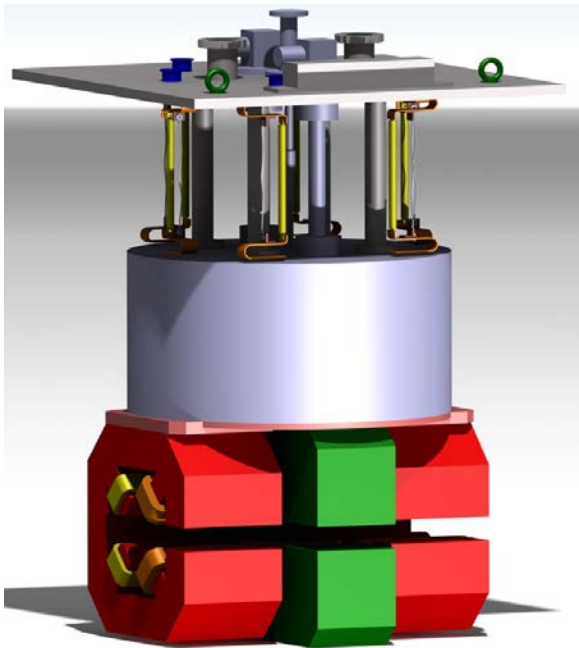


EU132: A FIXED GAP EPU



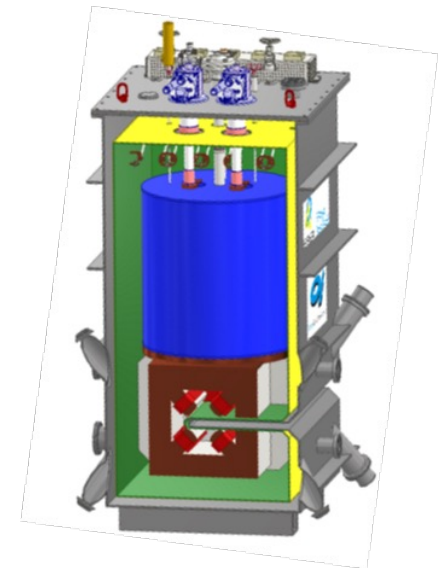
Refurbishment of existing devices
New ID are foreseen for the new beamlines

Superconducting Dipoles



Three beam lines at 35 and 50 keV and with flux above **10^{13} ph/sec** will be constructed and will be served by three 6 T SC-Dipoles.

Installation is expected from 2027.



The purchasing procedures are foreseen in 2024

Vacuum Chambers and Pumps

Sizes:

Elettra chamber scaled down by 2.7
⇒ 27 x 17 internal (1.5 mm
thickness)

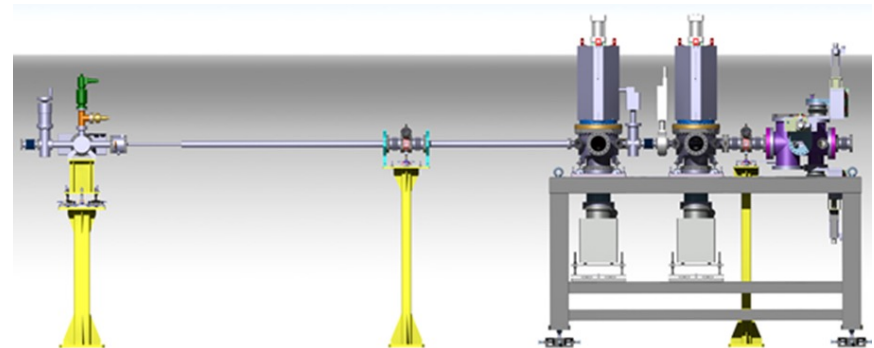
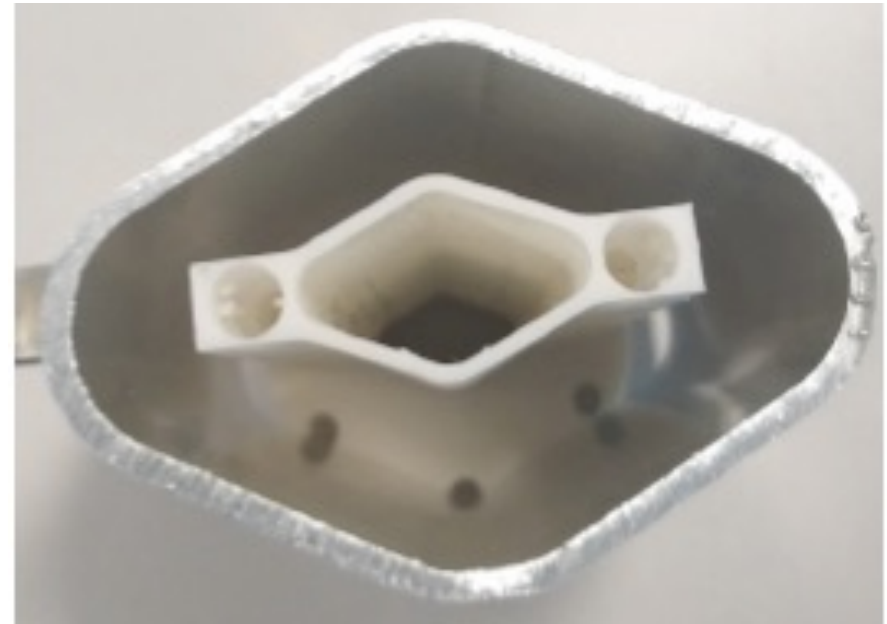
Material:

Cu (45% of the 259 m),

Al (20% of the 259 m),

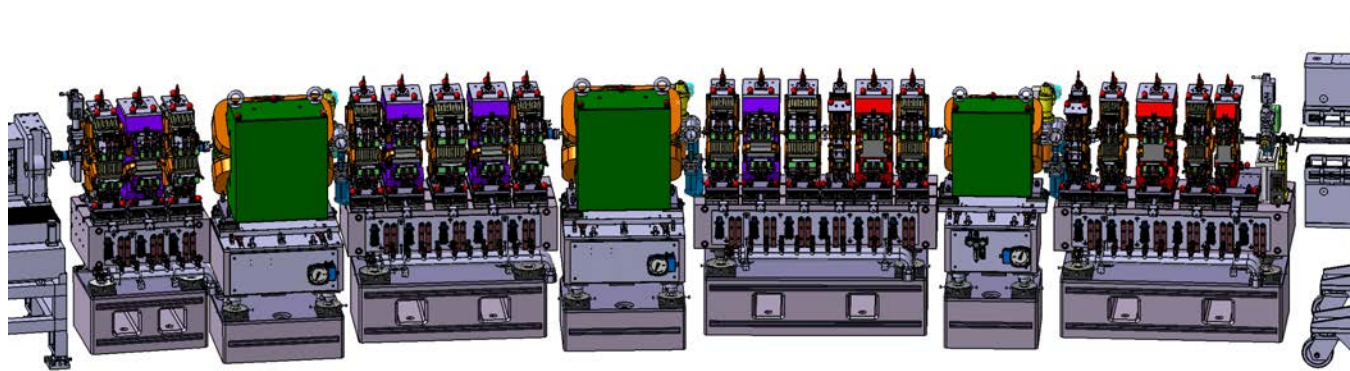
S. Steel (35% of the 259 m)

0.5 μm NEG-coated (90%)

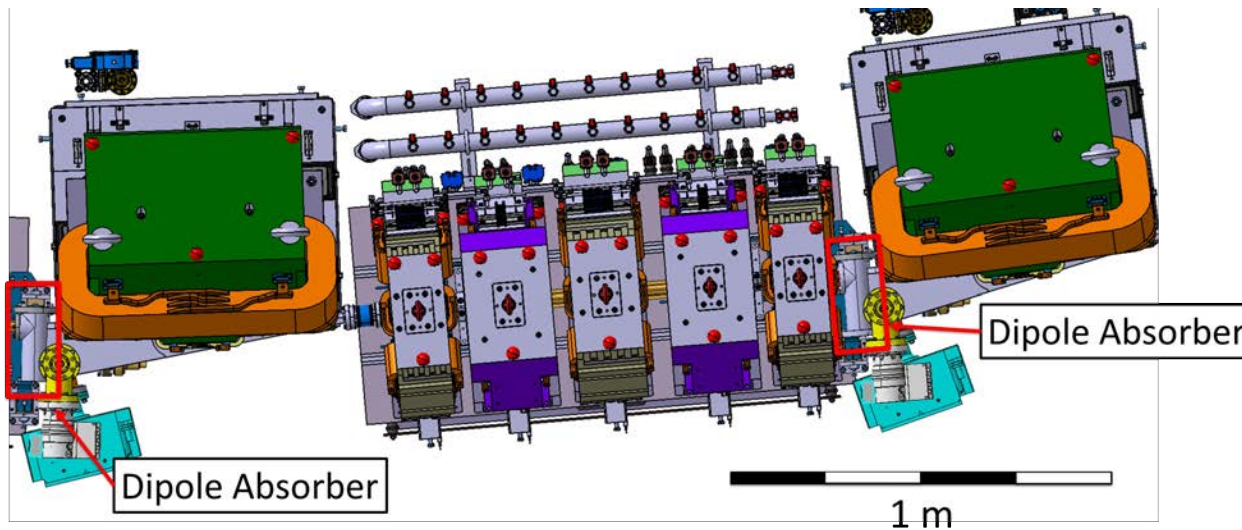


The procurement of the chambers and all chamber related material is scheduled from second half of 2023 to the first half of 2024

Girders and Photon Absorbers



8 Granite slab (1.5 x 0.6 x 0.3 m) + 6 dipole girders per achromat



Tight layout

High spatial power density (SPD):
 620 W mm^{-2}



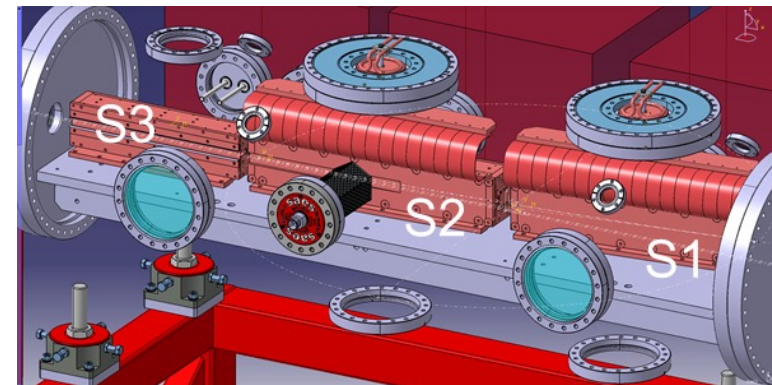
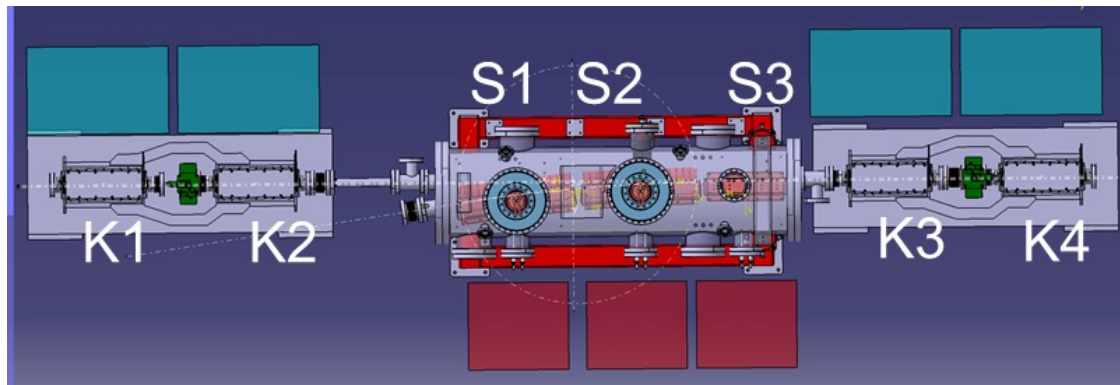
New absorber design needs:

- Able to spread incoming power
- Resilience to misalignments

Injector and Injection

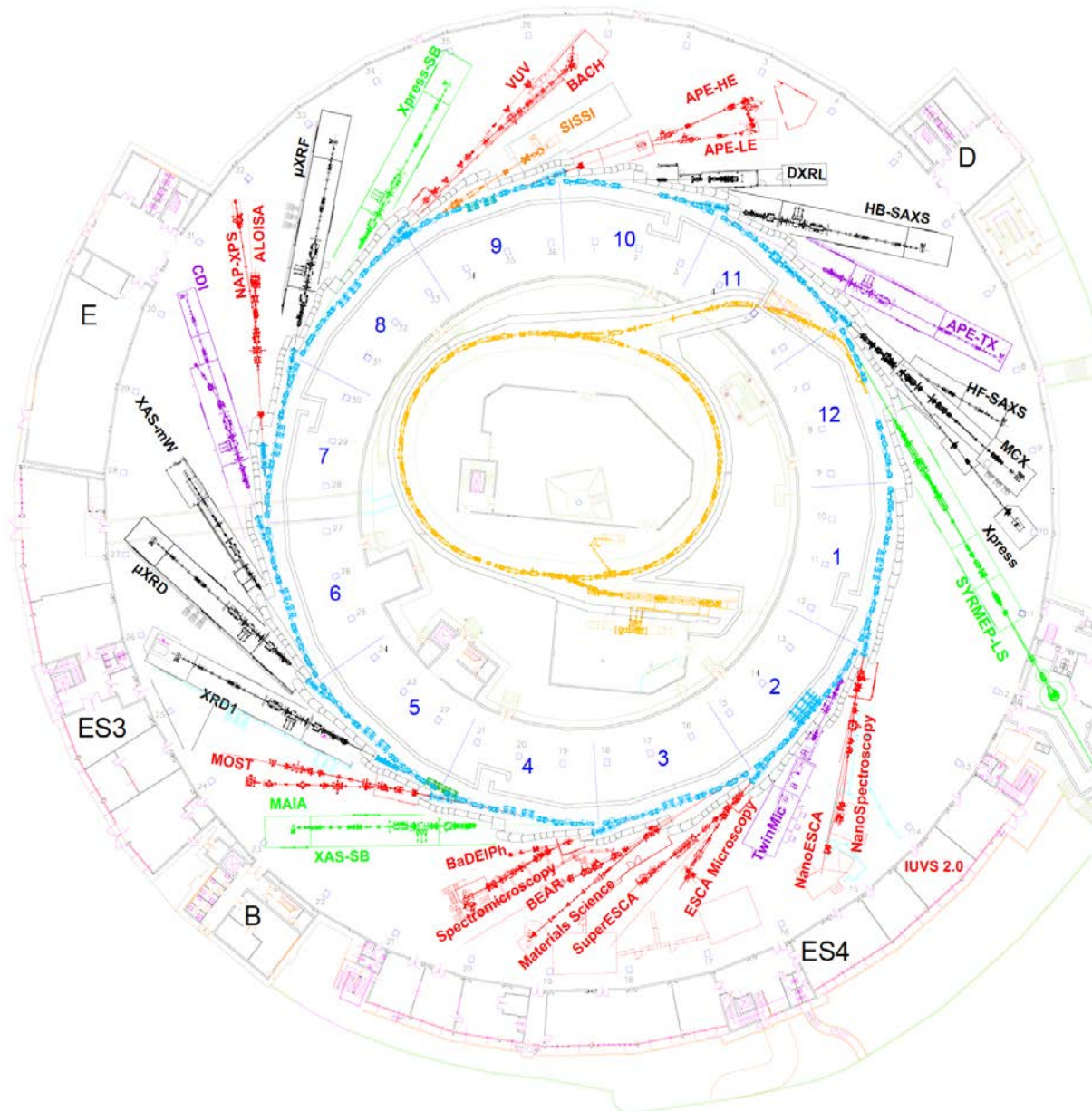
- ❑ New gun 90 kV , new HV modulators (stability)
- ❑ Renewal of Booster ring PSs & diagnostics

Beam separation 4 mm, pulse 3-5 μ s half sine wave for kickers and septa , thin septum separation thickness 1 mm.





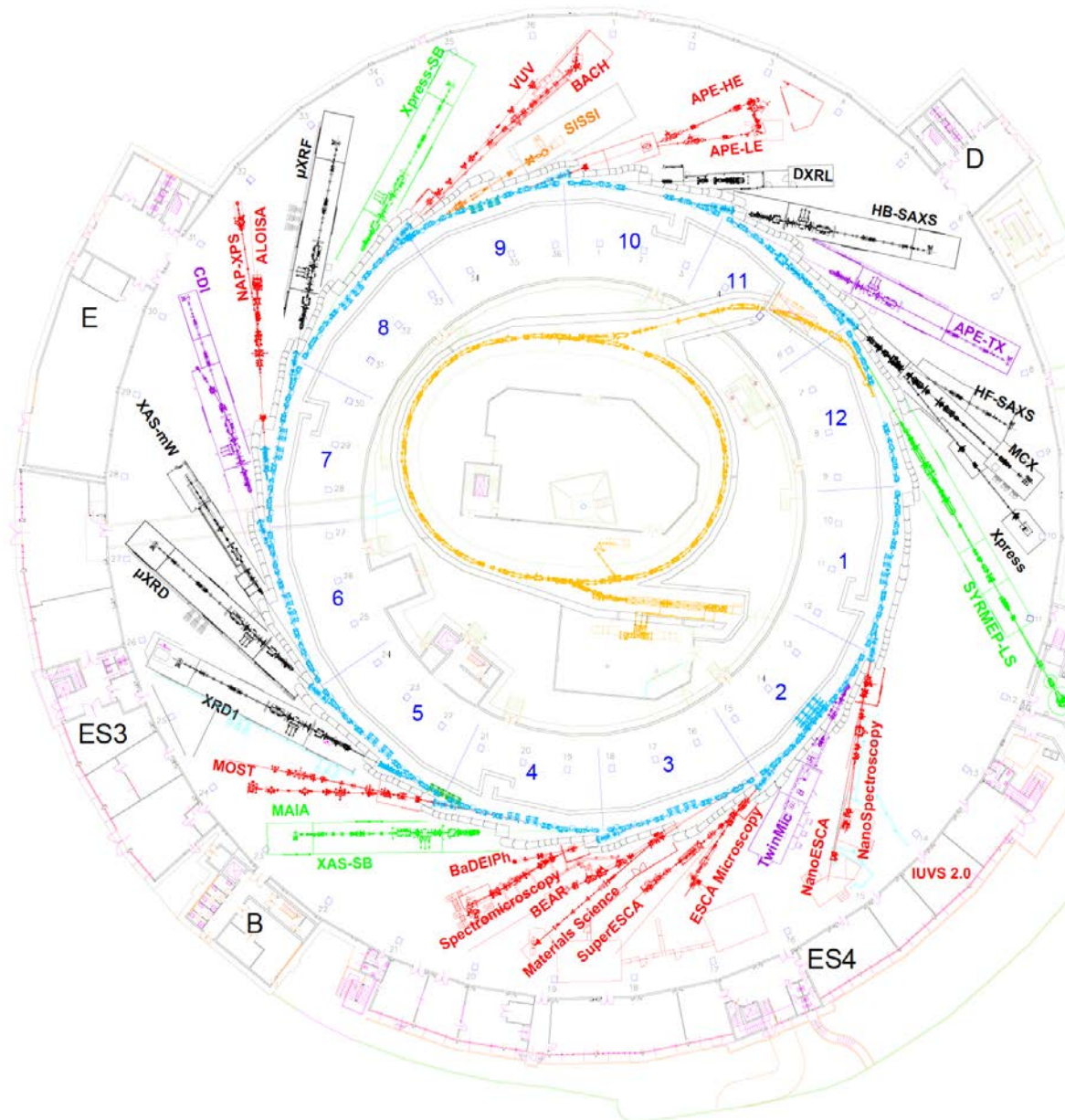
Beamline Upgrade Plan



- Increase the offer of hard X-ray, micro-spot techniques with **new beamlines**
- Install Super Bend sources for high energy (>50 keV) BLs (imaging, absorption, diffraction)
- Strengthen the capacities in the soft X-rays
- Upgrade the VUV/soft X spectroscopy beamlines
- Upgrade the VUV/soft X microscopy beamlines
- Upgrade the hard X-ray beamlines
- Maintain the IR/THz beamlines



Beamline Upgrade Plan



8 BLs will be permanently removed

9 BLs will keep the same position

13 BLs will be moved

12 New BLs

Old and New BLs will need:

New Detectors

New Diffractometers

New UHV Chambers

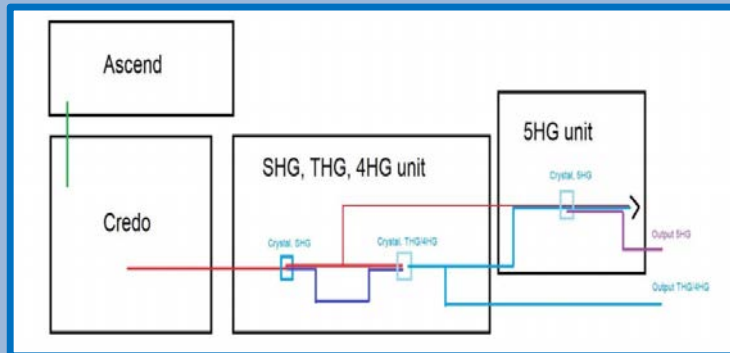
New UHV Manipulators

New Analyzers

New ...

The very low energy UV beamline moved to laser source: IUVS 2.0

Credo Tisa 1-3kHz
(Spectra-Physics Ascend-40T laser pump
+ Ti:Sapphire CREDO-TISA ns laser +
harmonic generation and mixing units)



High flux (mW)
Extended DUV range
Spectral linewidth $< 0.5 \text{ cm}^{-1}$

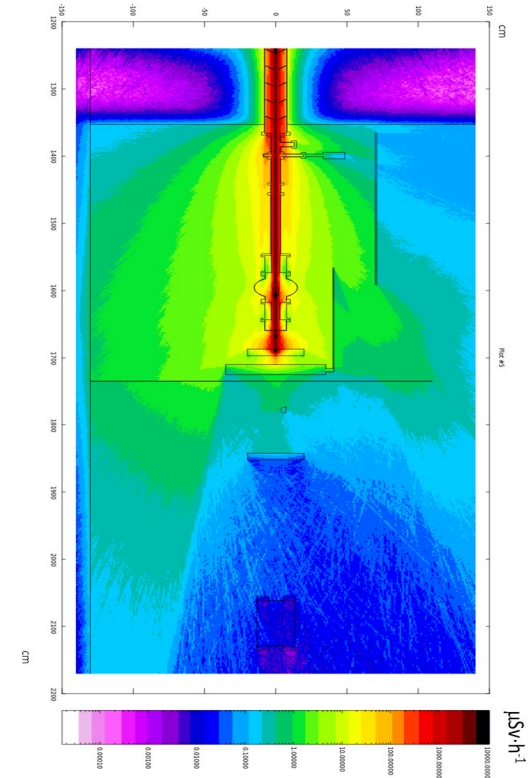


New lab ready, final installation and tests of the laser completed in September 2023

Radiation Safety Hutches Upgrade Program

➤ Cases to be defined:

- Definition of the safety level for the new hutches (walls thickness, roof, etc.):
- Verification of the safety level of existing hutches of the beamlines which will keep the same position (mostly soft-X and VUV)



Simulations output

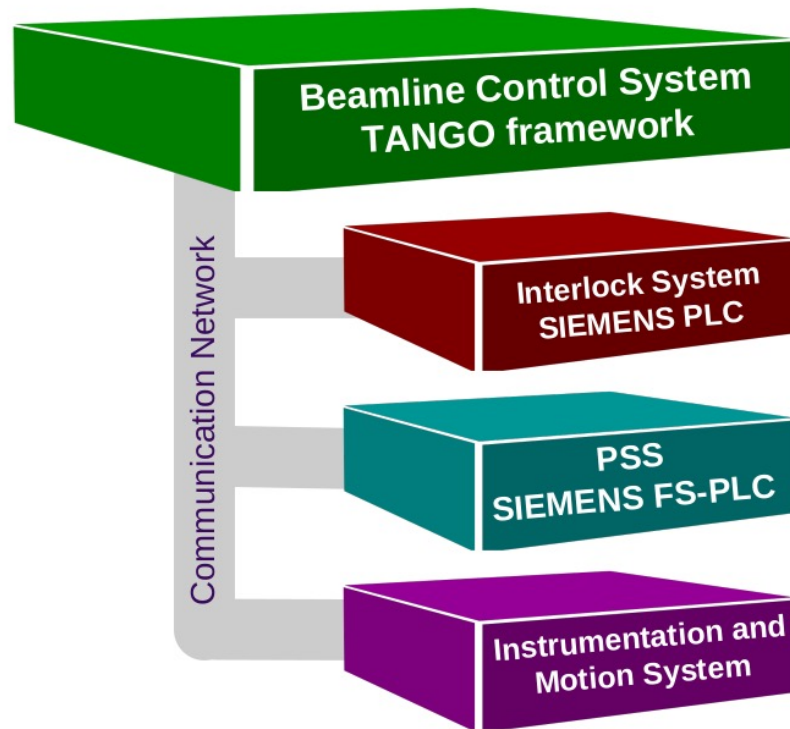
Cat. 1: Heavy hutches for the SBM beamlines

Cat. 2: Standard hutches for hard and tender X-ray beamlines

Cat. 3: Standard hutches for soft X-ray and VUV beamlines

Upgrade of the Beamlines Control System

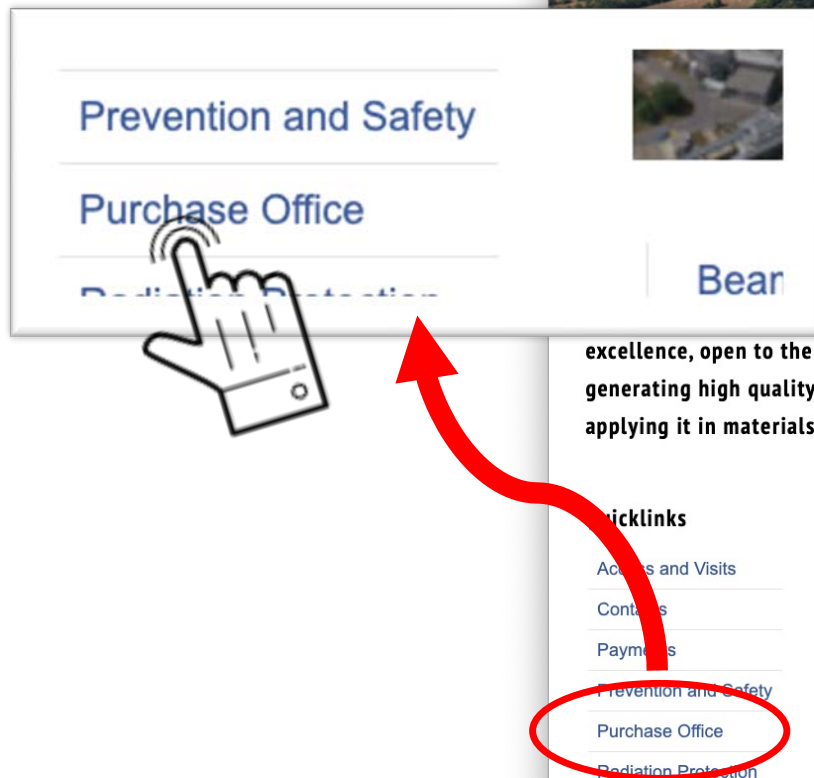
- **TANGO** control and supervisor framework as for the storage ring
- Interlock and PSS based on **Siemens PLC** as for the storage ring (*Better communication, logging and diagnostics*)
- Motion controller **YAMS** standardization

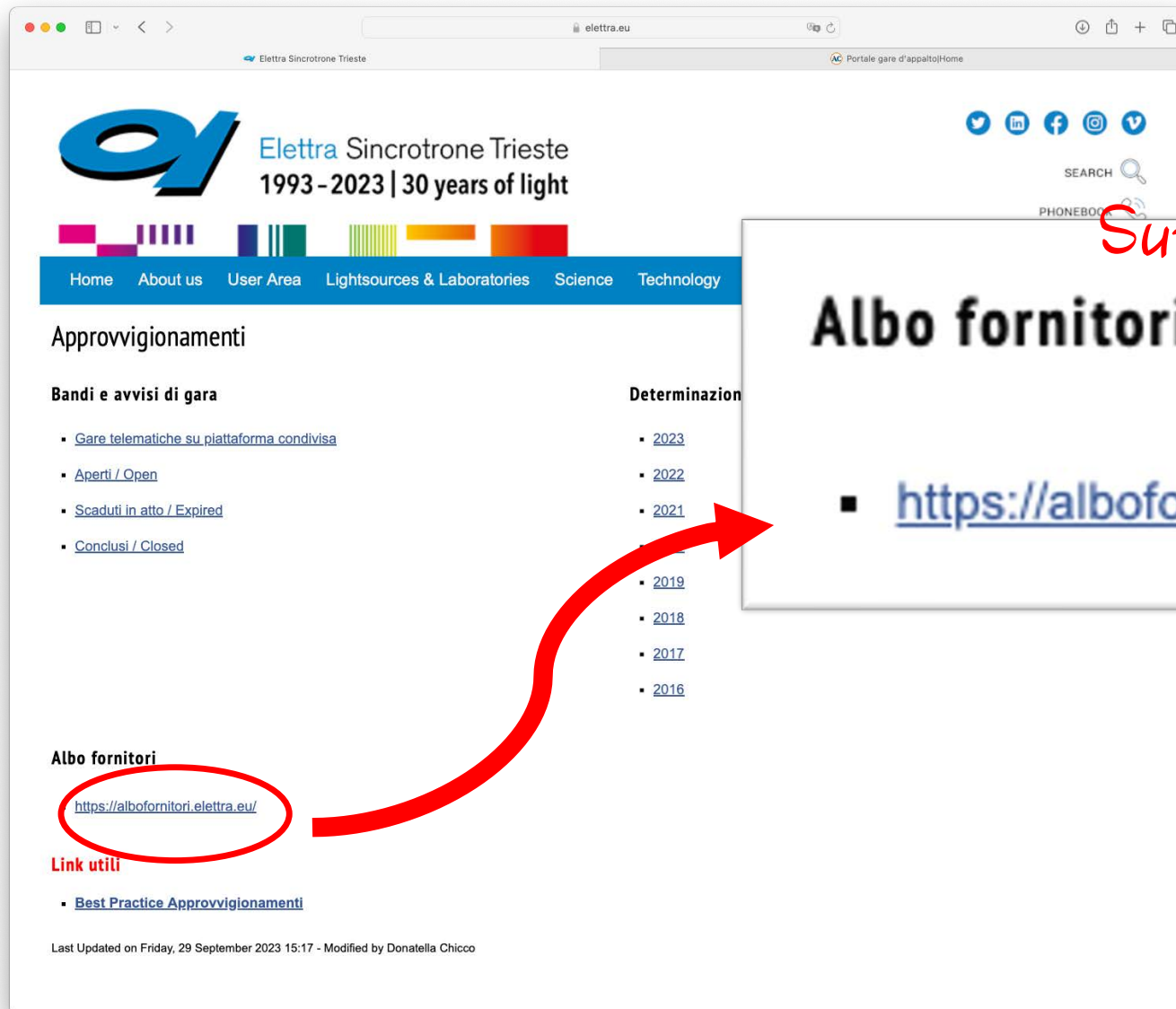


GE.CO. INTERLOCK SYSTEM

- Vacuum control and beam transport
- Based on Siemens PLC S7-1500
- Modular and reusable architecture
- Distributed system over private PROFINET network
- **Tango** ready

Procurement for Elettra 2.0





Approvvigionamenti

Bandi e avvisi di gara

- [Gare telematiche su piattaforma condivisa](#)
- [Aperti / Open](#)
- [Scaduti in atto / Expired](#)
- [Conclusi / Closed](#)

Determinazioni

- [2023](#)
- [2022](#)
- [2021](#)
- [2019](#)
- [2018](#)
- [2017](#)
- [2016](#)

Albo fornitori

<https://albofornitori.elettra.eu/>

Link utili

- [Best Practice Approvvigionamenti](#)

Last Updated on Friday, 29 September 2023 15:17 - Modified by Donatella Chicco

Albo fornitori

Supplier register

▪ <https://albofornitori.elettra.eu/>





Elettra
Sincrotrone
Trieste

Albo Fornitori

Supplier register

12:11
Europe/Rome

Elettra Sincrotrone Trieste

este S.C.p.A.

Benvenuti nella piattaforma digitale per la gestione degli Elenco Fornitori e delle Gare Telematiche della Elettra-Sincrotrone Trieste S.C.p.A. di interesse nazionale

Gli operatori che intendano iscriversi negli elenchi professionali o come ditte esecutrici di lavori pubblici, devono effettuare la registrazione alla piattaforma. Successivamente, attraverso una procedura guidata, saranno abilitate le credenziali per accedere all'area riservata, nella quale sarà possibile partecipare immediatamente ad una "Procedura...

Leggi di più

Accesso Fornitori

E-mail
Inserisci la tua email

Password
Inserisci la password

Hai dimenticato la password?

REGISTRATI ACCEDI

oppure accedi con

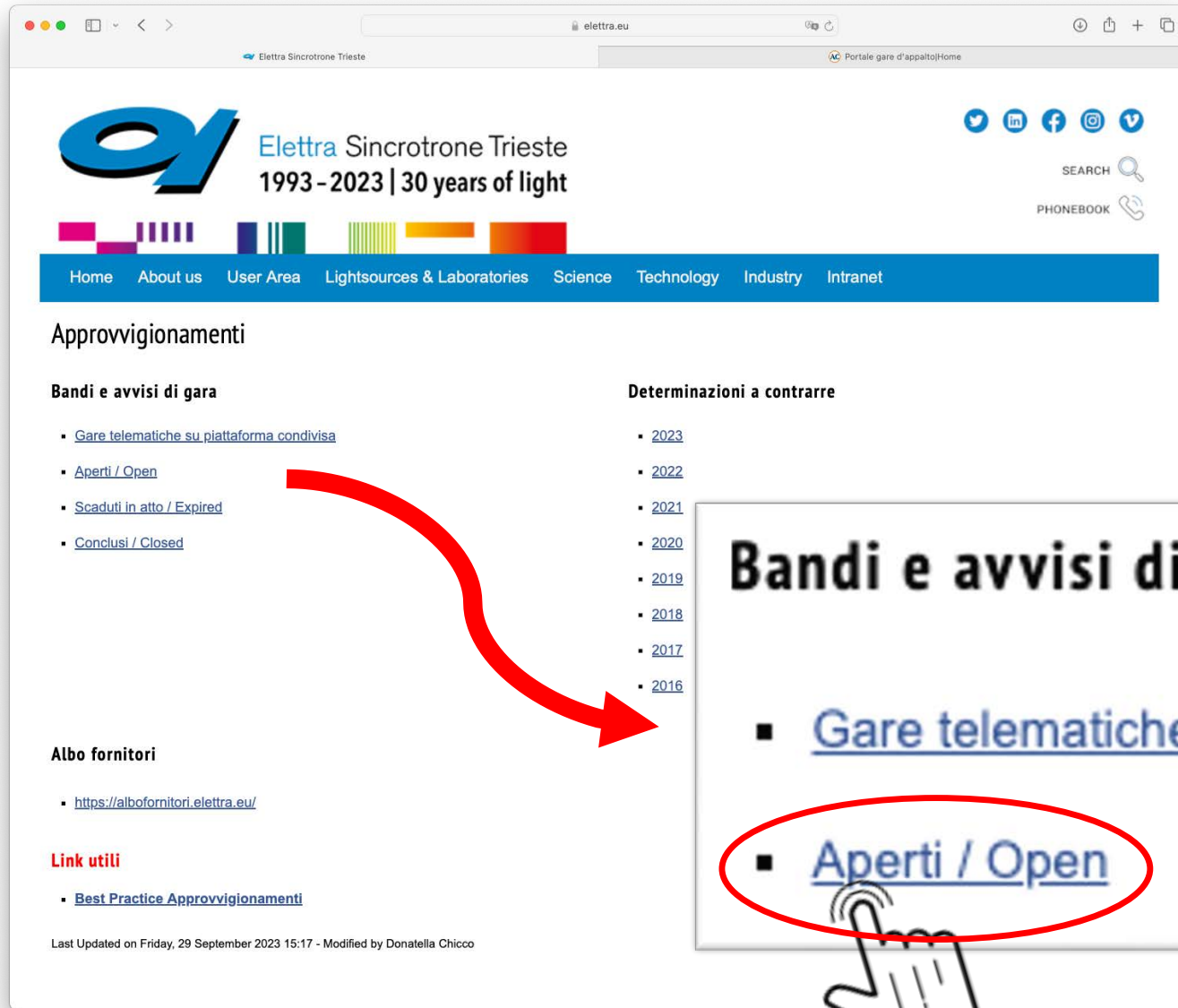
NETWORKPA

Cos'è NetworkPA?

- The registration is required and has a duration of 1 year, renewable thereafter.
- It can be used for orders below €140,000.
- It can also be used for direct purchases.
- It allows access (for a fee) to a network of other 500 supplier registers in different Public Administrations (P.A.)

The screenshot shows the M.E.P.A. website interface. At the top, there are navigation links for 'Elettra Sincrotrone Trieste', 'Portale gare d'appalto|Home', 'Elenco Fornitori - Elettra-Sincrotrone Trieste S.C.p.A.', and 'Program - How it works - acquistinretepa'. Below these are logos for 'consip' and 'MEF Ministero dell'Economia e delle Finanze', along with 'SIGN IN or CREATE AN ACCOUNT' and a language selector for 'ENG' with a UK flag. The main header includes the 'acquistinretepa' logo and navigation links: 'Chi siamo', 'Aree merceologiche', 'Acquista', 'Vendi', and 'Supporto'. A search bar is also present with the text 'cerca nel portale ...'. On the left, a 'PROGRAM' sidebar lists 'How it works', 'Purchasing Tools', 'Figures', and 'GPP'. The main content area is titled 'How it works' and contains a descriptive paragraph: 'The Program for the rationalization of public spending of the P.A. – run by the Ministry of Economy and Finance through Consip S.p.A. – supports Public Administrations in managing their procurement processes providing innovative e-procurement solutions.' Below this is a flowchart illustrating the process: 1. 'Ministry of Economy and Finance defines the guidelines of the Program' (MEF logo). 2. 'Public Administrations cooperate to define the procurement needs' (building icon). 3. 'Economic Operators contribute to the market analysis' (person icon). 4. 'Consip publishes tender procedures according to the defined needs' (megaphone icon). 5. 'Economic Operators participate to tender procedures' (person icon). 6. 'Consip activates the procurement initiatives' (gavel icon). 7. 'Public Administrations procure goods and services' (building icon). Dashed arrows connect these steps in a sequence.

For computer purchases (SW and HD), Elettra is required to make them through the M.E.P.A. (Electronic Market for Public Administrations) if the product is available there; otherwise, a resolution from the Board of Directors is needed to go to the market.



The screenshot shows the Elettra Sincrotrone Trieste website. The main navigation bar includes links for Home, About us, User Area, Lightsources & Laboratories, Science, Technology, Industry, and Intranet. The 'Bandi e avvisi di gara' section is highlighted, showing a list of links: [Gare telematiche su piattaforma condivisa](#), [Aperti / Open](#), [Scaduti in atto / Expired](#), and [Conclusi / Closed](#). A red arrow points from the 'Aperti / Open' link to a magnified view of the same link on the right. The magnified view shows the link 'Aperti / Open' circled in red, with a hand icon pointing to it. The text 'Tenders and bidding notices' is written in red above the magnified view.

Bandi e avvisi di gara

- [Gare telematiche su piattaforma condivisa](#)
- [Aperti / Open](#)
- [Scaduti in atto / Expired](#)
- [Conclusi / Closed](#)

Determinazioni a contrarre

- [2023](#)
- [2022](#)
- [2021](#)
- [2020](#)
- [2019](#)
- [2018](#)
- [2017](#)
- [2016](#)

Albo fornitori

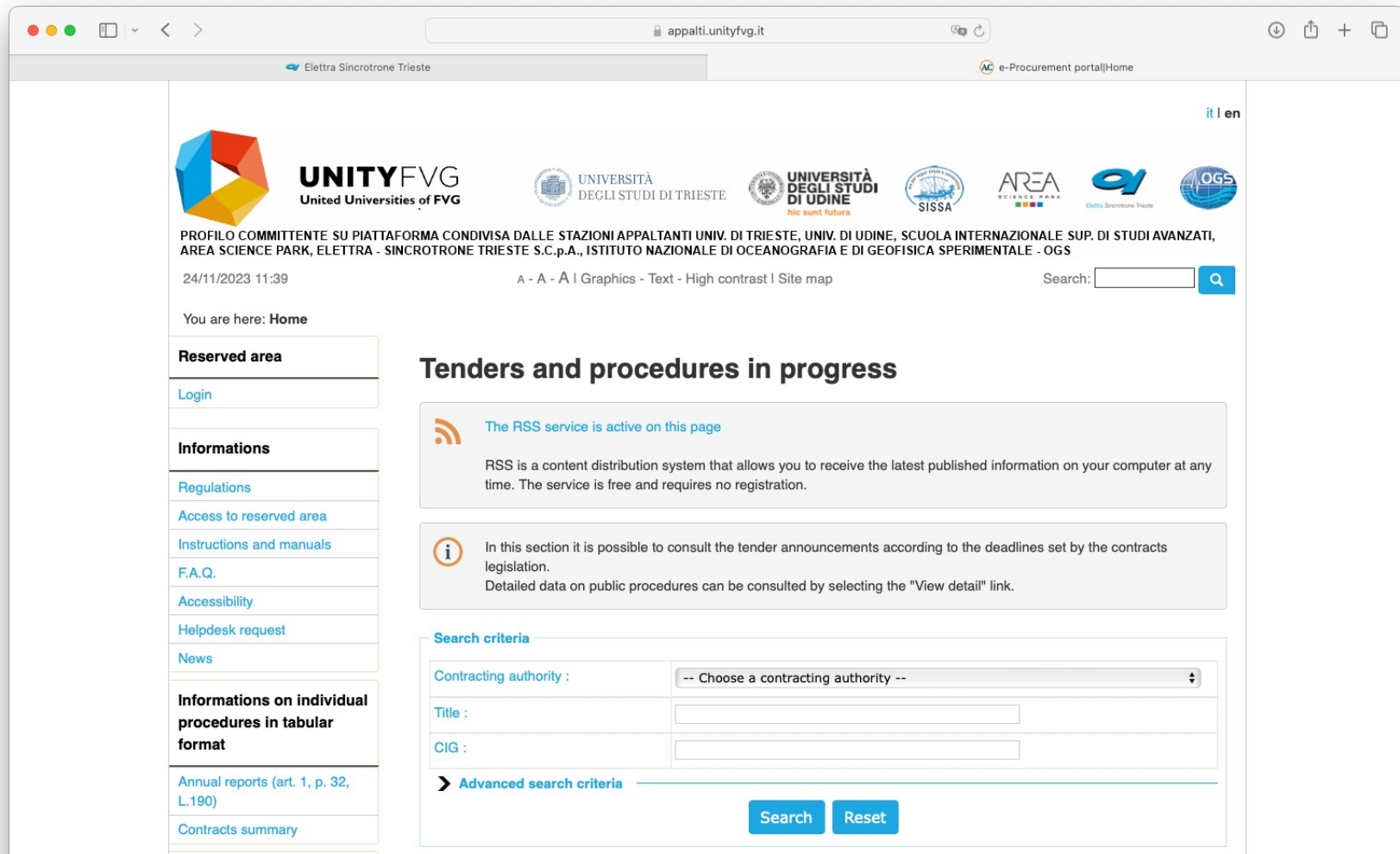
- <https://albofornitori.elettra.eu/>

Link utili

- [Best Practice Approvvigionamenti](#)

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Tenders and
bidding notices

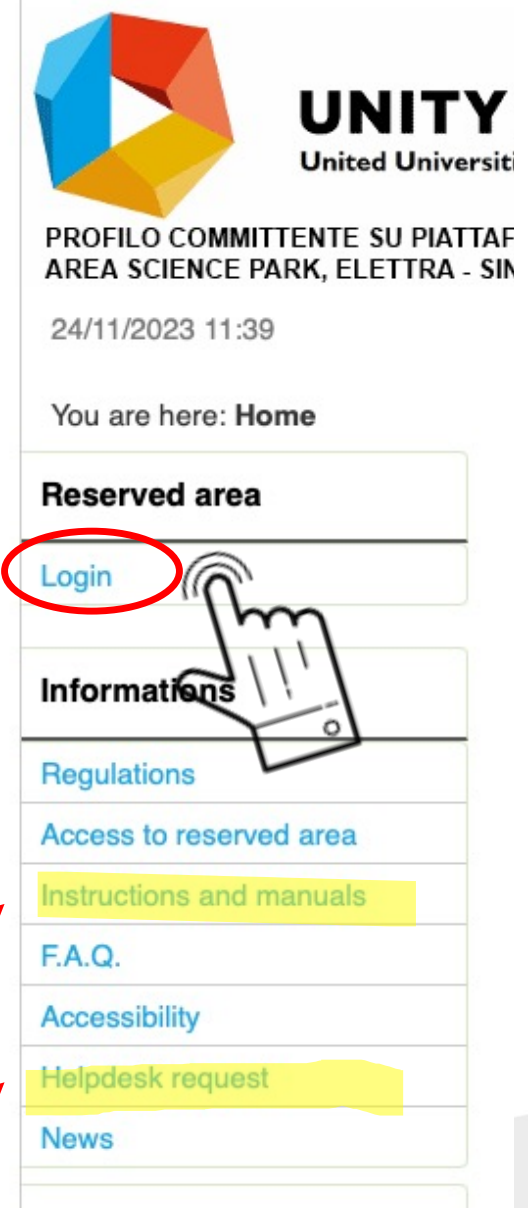


The screenshot shows the homepage of the appalti.unityfvg.it website. The header includes the UnityFVG logo and the text "United Universities of FVG". Below this, there is a list of partner institutions: Università degli Studi di Trieste, Università degli Studi di Udine, SISSA, AREA Science Park, Elettra Sincrotrone Trieste, and OGS. The main content area is titled "Tenders and procedures in progress" and includes an RSS service notice and a section for tender announcements. A sidebar on the left contains links for "Reserved area", "Login", "Informations", "Regulations", "Access to reserved area", "Instructions and manuals", "F.A.Q.", "Accessibility", "Helpdesk request", "News", "Informations on individual procedures in tabular format", "Annual reports", and "Contracts summary". The bottom of the page features a search bar and a "Search" button.

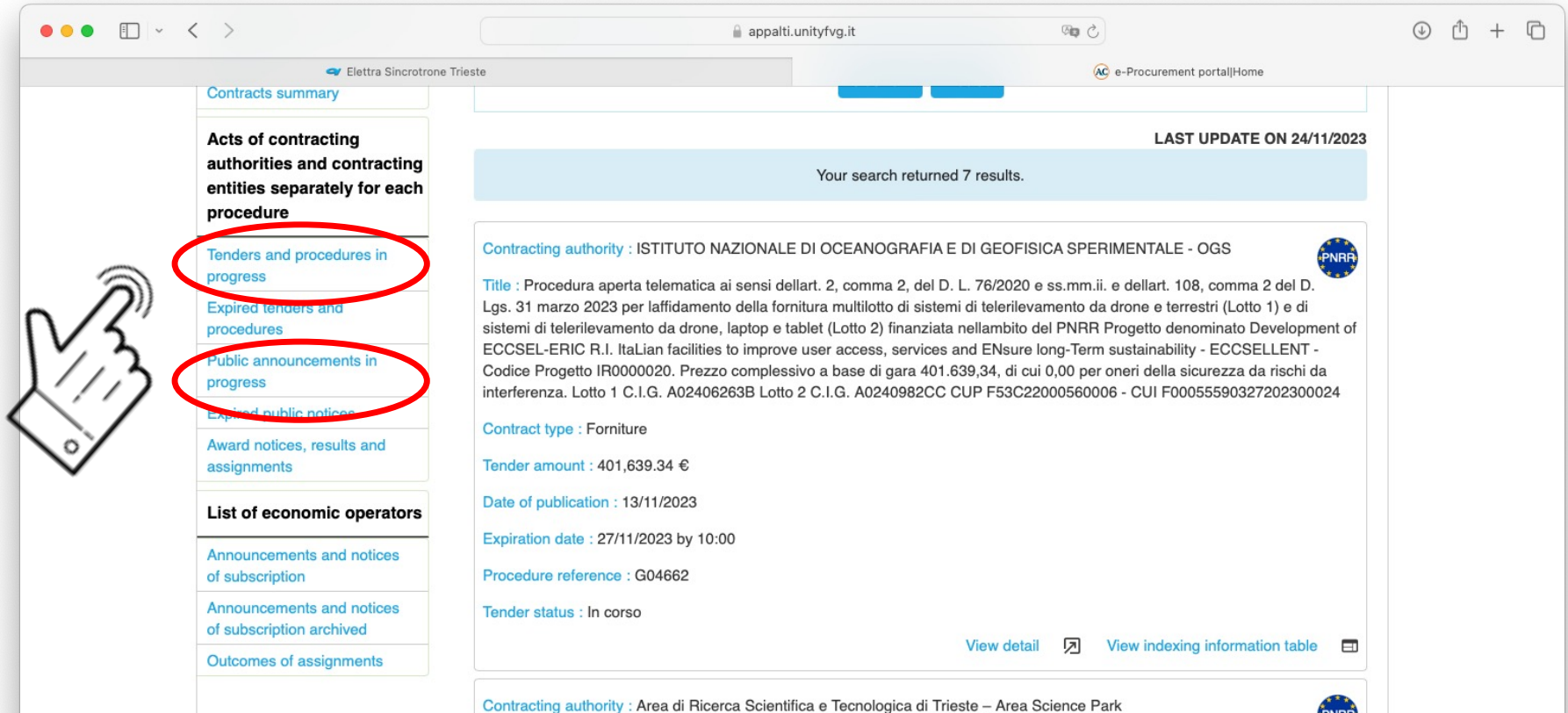
Telematic platform used by Elettra shared with other regional public administrations.

How to take part in bidding processes

- Registration is required even if you are already registered in Elettra's suppliers' register.
- Registration enables participation in tenders from other contracting stations.
- Manuals are available for registration and platform usage
- You can also contact the call center at +39 0422267755



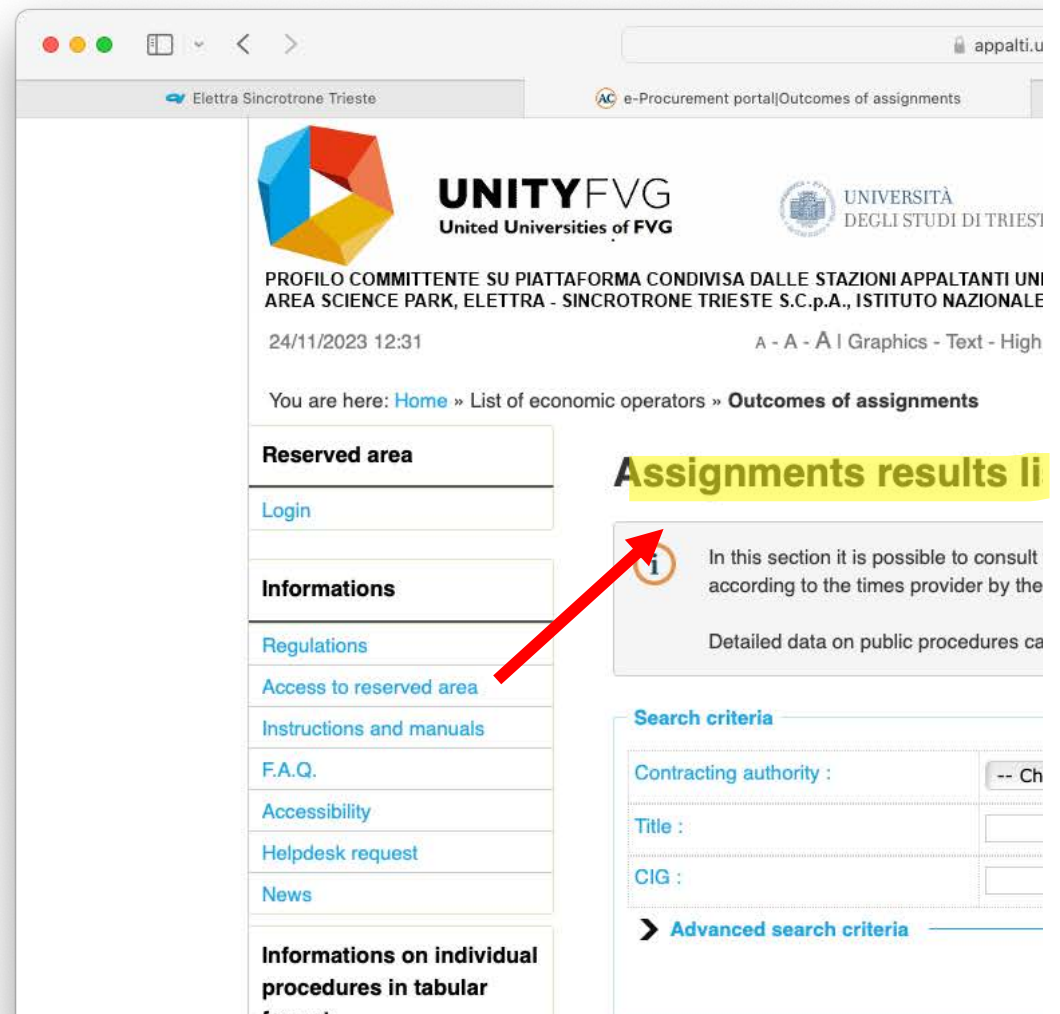
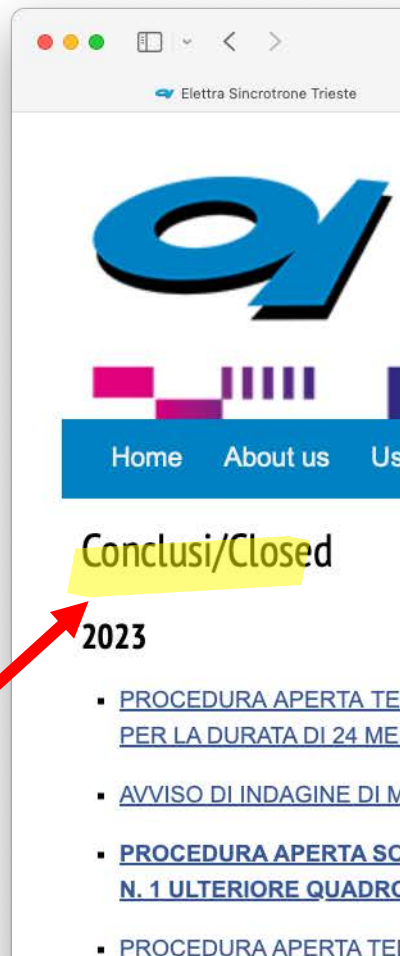
Where to find information about tenders/bidding processes



The screenshot shows the Eletttra Sincrotrone Trieste e-Procurement portal. On the left sidebar, under 'Contracts summary', the following links are listed: 'Acts of contracting authorities and contracting entities separately for each procedure', 'Tenders and procedures in progress' (circled in red), 'Expired tenders and procedures', 'Public announcements in progress' (circled in red), 'Expired public notices', 'Award notices, results and assignments', and 'List of economic operators'. Below these, there are links for 'Announcements and notices of subscription', 'Announcements and notices of subscription archived', and 'Outcomes of assignments'. A hand icon points towards the 'Tenders and procedures in progress' and 'Public announcements in progress' links. The main content area shows search results for 'ISTITUTO NAZIONALE DI OCEANOGRAPHIA E DI GEOFISICA SPERIMENTALE - OGS'. The results include the title of the tender, the contract type (Forniture), the tender amount (401,639.34 €), the date of publication (13/11/2023), the expiration date (27/11/2023 by 10:00), the procedure reference (G04662), and the tender status (In corso). The contracting authority is listed as 'Area di Ricerca Scientifica e Tecnologica di Trieste – Area Science Park'.

Elettra's tenders are also published on Elettra's website. Additionally, those above the EU threshold are published in the Official Journal of the European Union.

Assignments Results



The outcomes/results of Elettra's tenders are published on Elettra's website and on the UNITY FVG platform.

