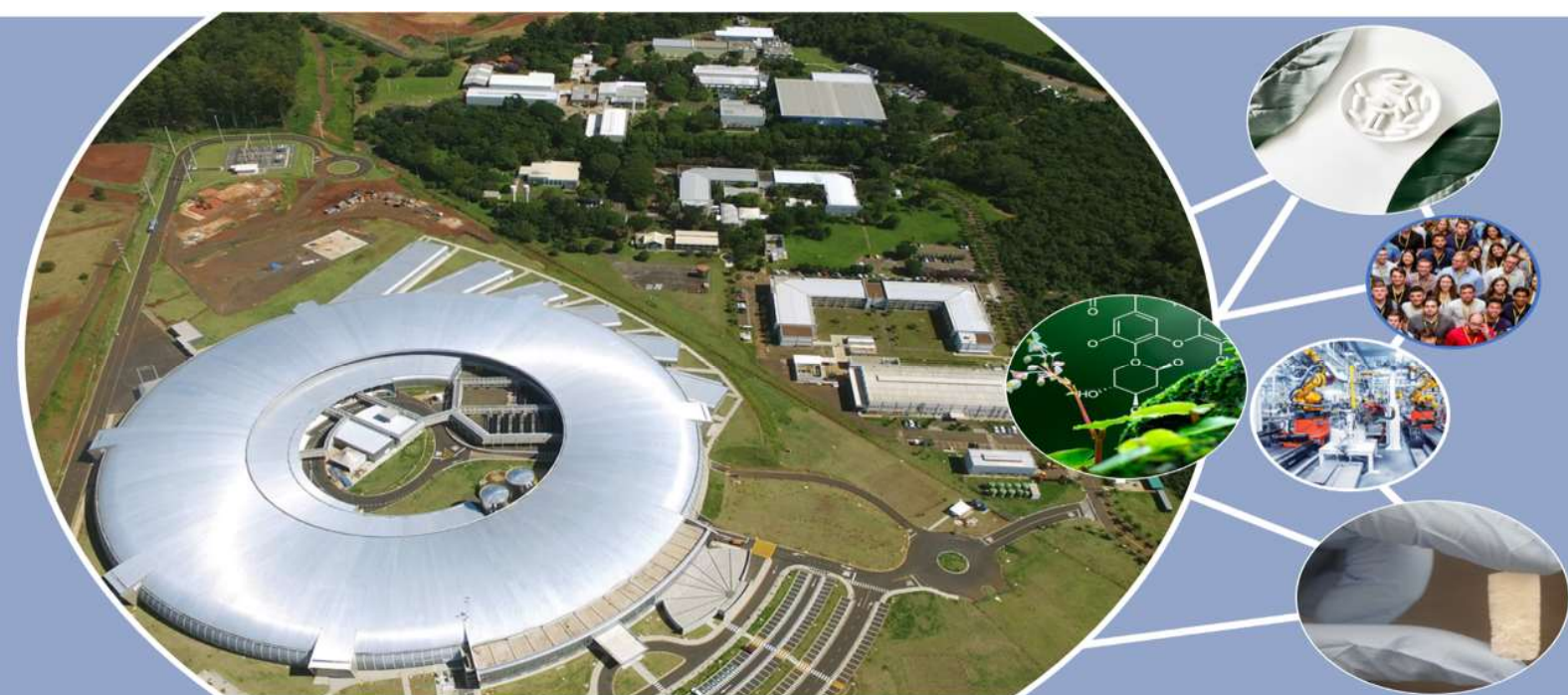


CNPEM – Brazilian Research Center in Energy and Materials



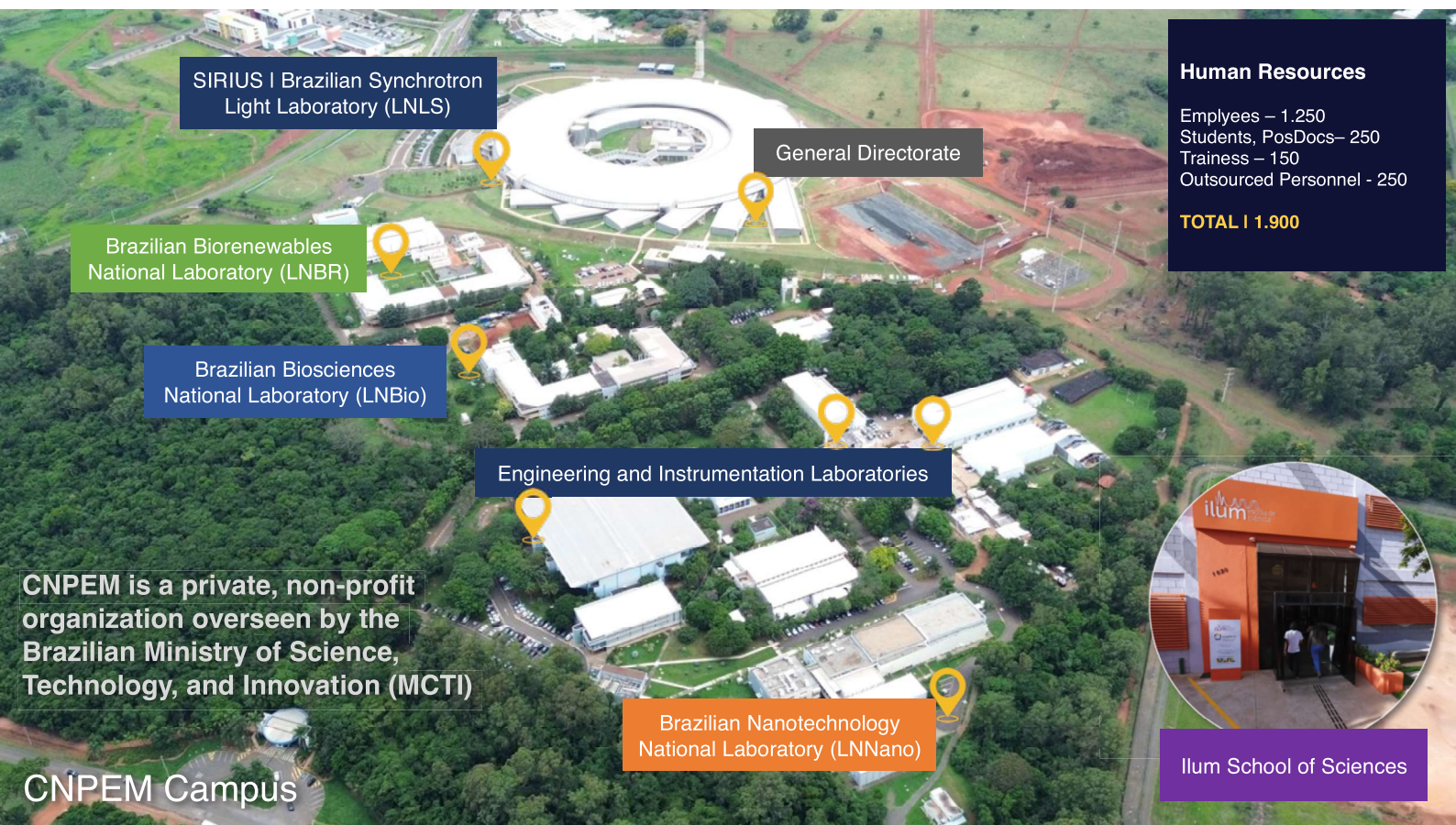
Antonio José Roque da Silva
Director General - CNPEM
jose.roque@cnpem.br



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CNPEM is a private, non-profit organization overseen by the Brazilian Ministry of Science, Technology, and Innovation (MCTI)

CNPEM Campus

Human Resources

Employees – 1.250
Students, PosDocs– 250
Trainees – 150
Outsourced Personnel - 250

TOTAL | 1.900



Illum School of Sciences





**Important Turning Point in the Brazilian Science
- “Big facility”, in house development**

A pioneering lab in Brazil

First synchrotron light source in the southern hemisphere

Around 85% built in house

Built between 1987-1997



**Training of human
resources**



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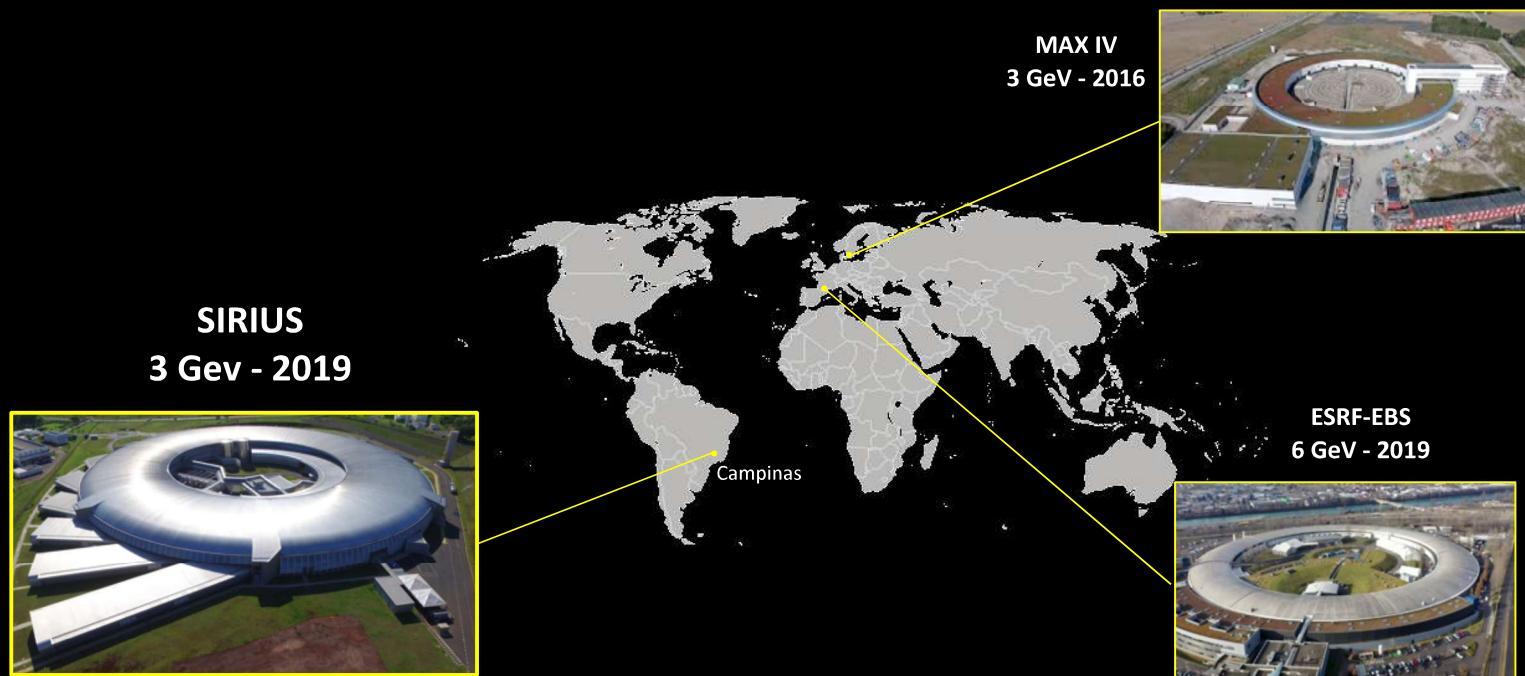
But not competitive at an international level...



Sirius – a competitive synchrotron light source – 4th generation



4th Generation Storage Rings in operation worldwide



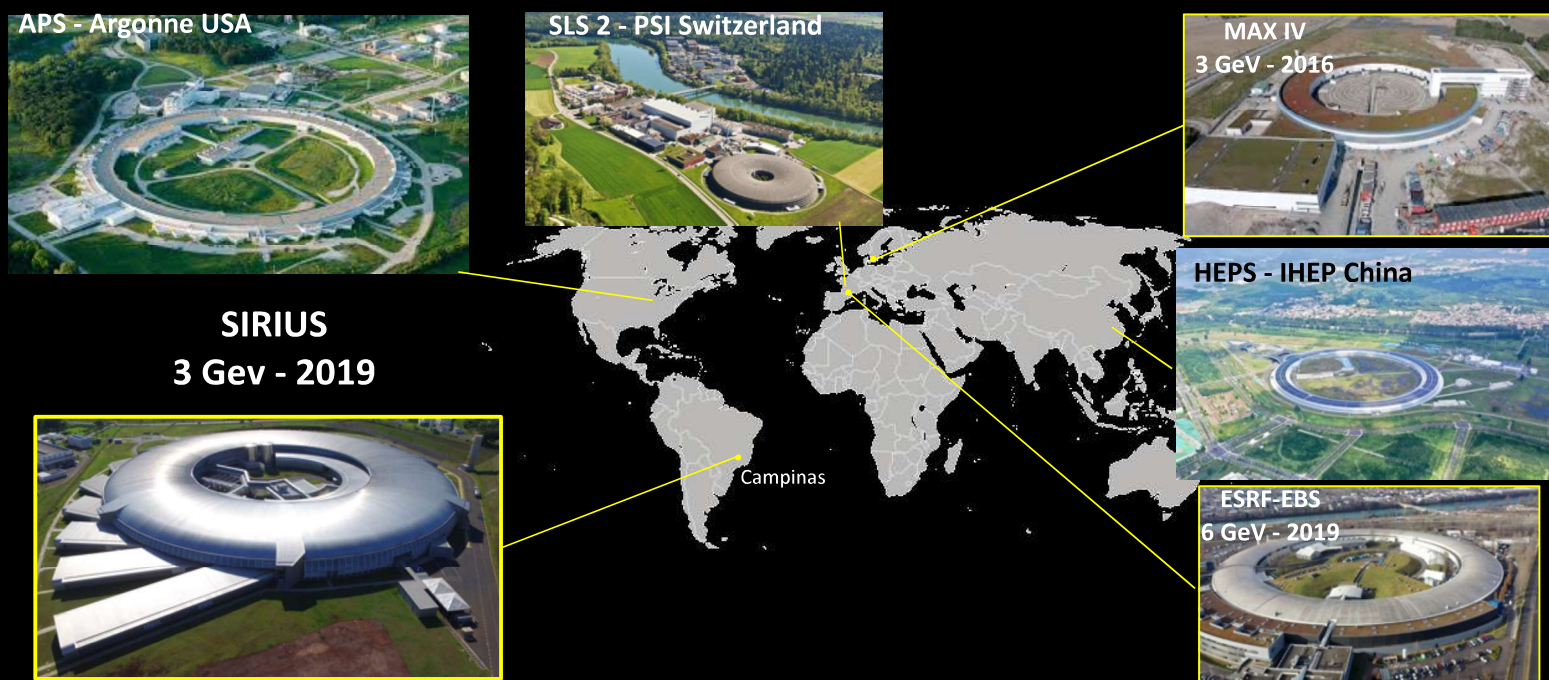
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GOVERNO DO
BRASIL
DO LADO DO POVO BRASILEIRO

4th Generation Storage Rings in operation worldwide



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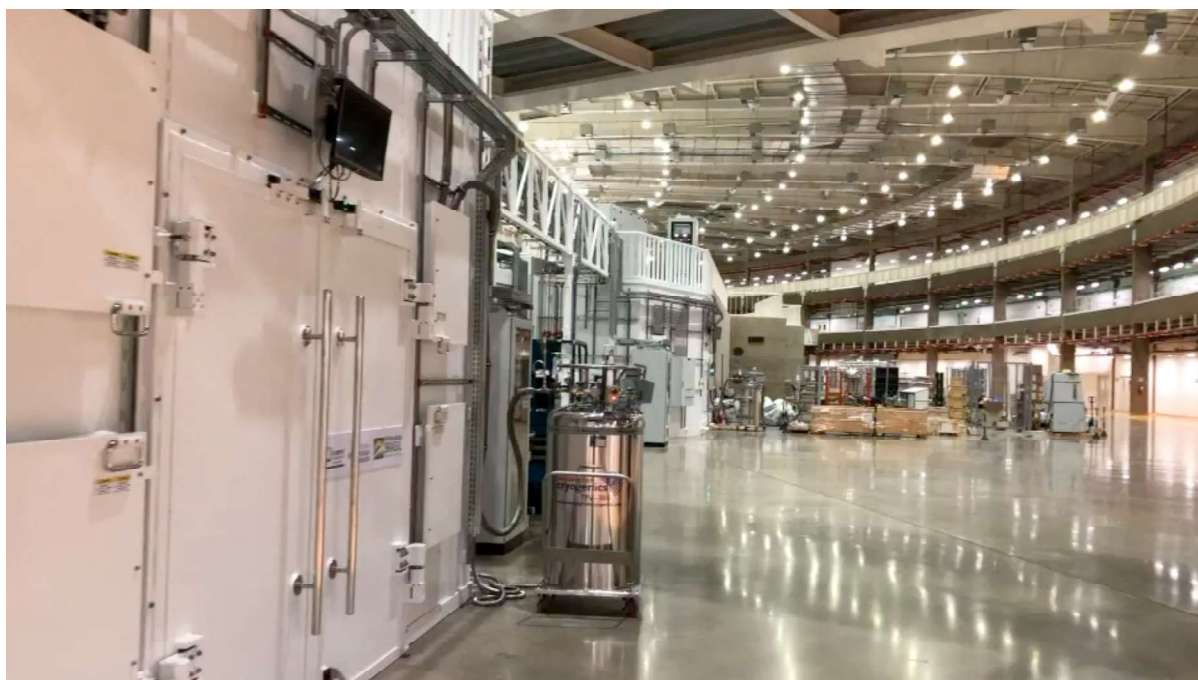
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CARNAÚBA beamline

Tender X-Ray Nanoprobe (2-15 keV)

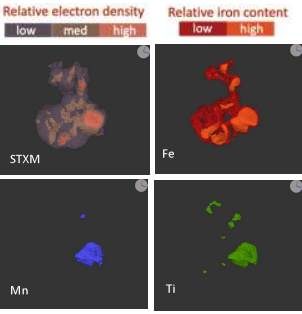


Experiments done at Sirius

From roots to soil
microaggregates

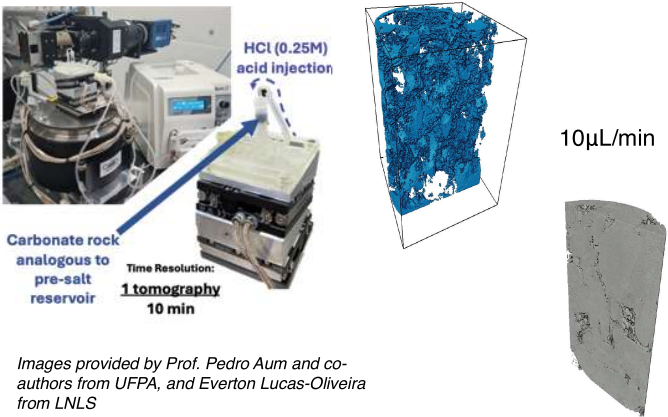
@ MOGNO

@ CATERETÊ



D. Hesterberg, R. Rabelo and C. Pólo, C. Pérez, H. Tolentino, F. da Silva and P. Ferraz

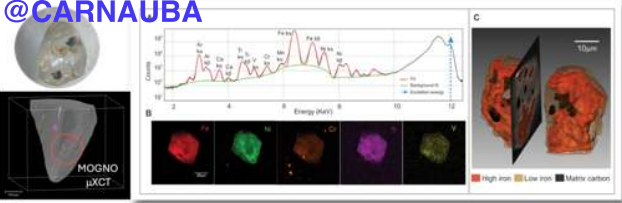
Rock dissolution during Fluid Injection



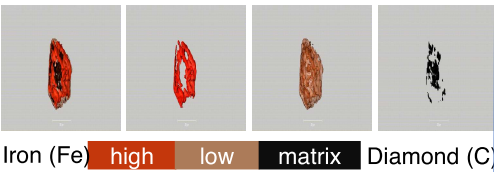
Images provided by Prof. Pedro Aum and co-authors from UFPA, and Everton Lucas-Oliveira from LNLS

Multiscale and multi-technique to uncover super-deep diamonds and their mineral inclusions

Nano X-ray Fluorescence Tomography (n-XFT)
@CARNAÚBA



Carolina Camarda, Master thesis (2024);
Collaboration with Fernanda Gervasoni (UFPel)



Heart



Sirius Phase I - 14 beamlines

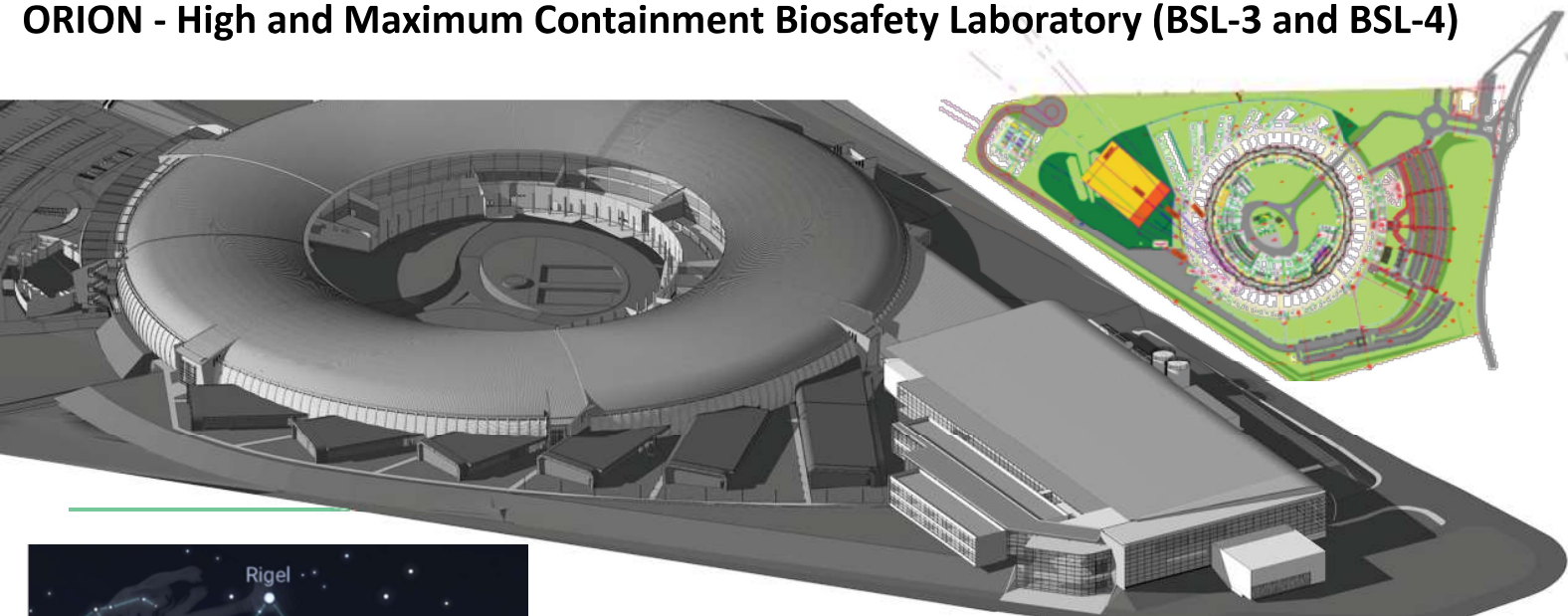


Sirius Phase II

- 10 New Beamlines



ORION - High and Maximum Containment Biosafety Laboratory (BSL-3 and BSL-4)

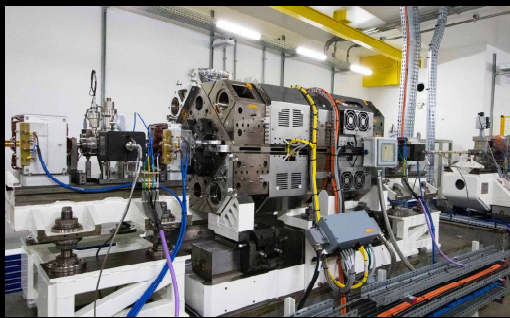


Technology development highlights

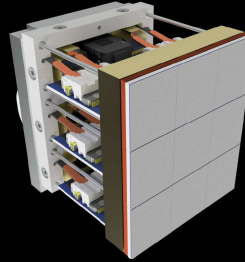
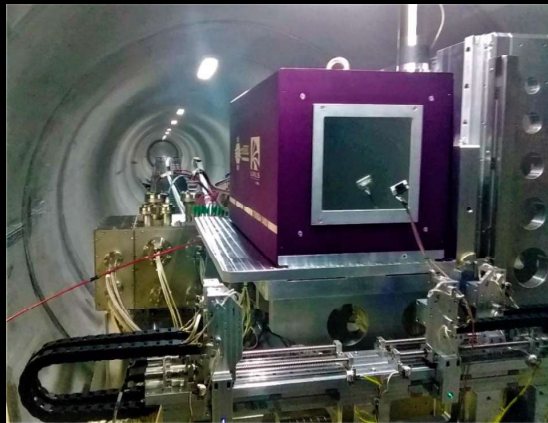
Magnets



Delta Undulator

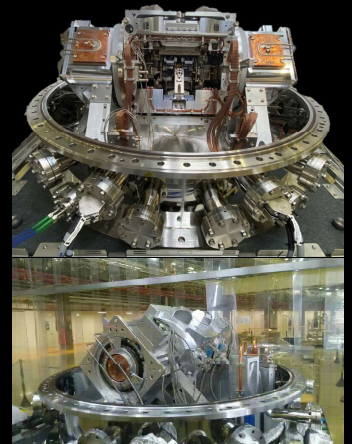


X-Ray detectors



Courtesy of Harry Westphal Jr.

X-Ray monochromators



CERN Cooperation and Opportunities in Brazil



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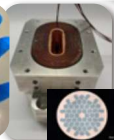
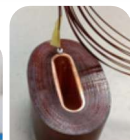
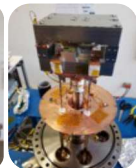
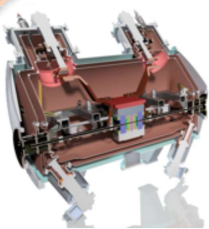


CNPEM & CERN Agreement

Scientific agreement between CNPEM and CERN signed in Dec 2020, sharing across any area of mutual interest, with emphasis on **accelerator technologies, magnets, and superconducting materials.**



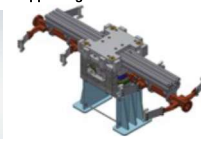
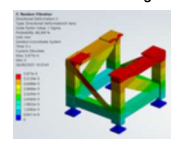
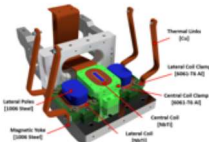
Vertical Cryostat for Cryogenic Temperature Testing



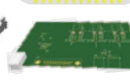
Prototyping and manufacturing of the coils



Mounting and Supporting Device

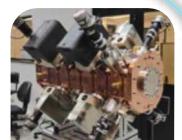


Prototypes of the quench protection system and power supply



Superconducting Wavelength Shifter (SWLS)

Ongoing development of a >6 T superconducting magnet to be installed in one of the straight sections of Sirius. Our developments cover electromagnetic design, coil manufacturing, mechanical design, cryogenic design, design and construction of new power supplies and quench protection.



Radiofrequency Quadrupole (RFQ) Cavity

The effort includes in-house design and fabrication of the RFQ accelerating cavity, the development of a custom vacuum-sealing solution tailored to the system, and the integration of all subsystems into a robust, clinically oriented platform.

Associate Member State of CERN

- Since March 2024, Brazil is an **Associate Member State of CERN**, the first in South America.
- Brazil is an Associate Member of CERN, unlocking access for Brazilian companies, now **eligible to bid for CERN contracts**.

- **CNPEN supports the Industrial Liaison Officer - ILO activities**

Procurement and Industrial
Services Group

Who to Contact in Your Country

Brazil

Industrial Liaison Officers (ILO's) are appointed by CERN's Member States to facilitate the flow of communication between CERN and its suppliers. ILO's can provide advice on the opportunities available for doing business with CERN and the support available to firms in their local regions.



Rafael Navarro

Organization

CNPEN

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13083-100, Brazil

Telephone

+5511972814717

Email

rfabran@gmail.com

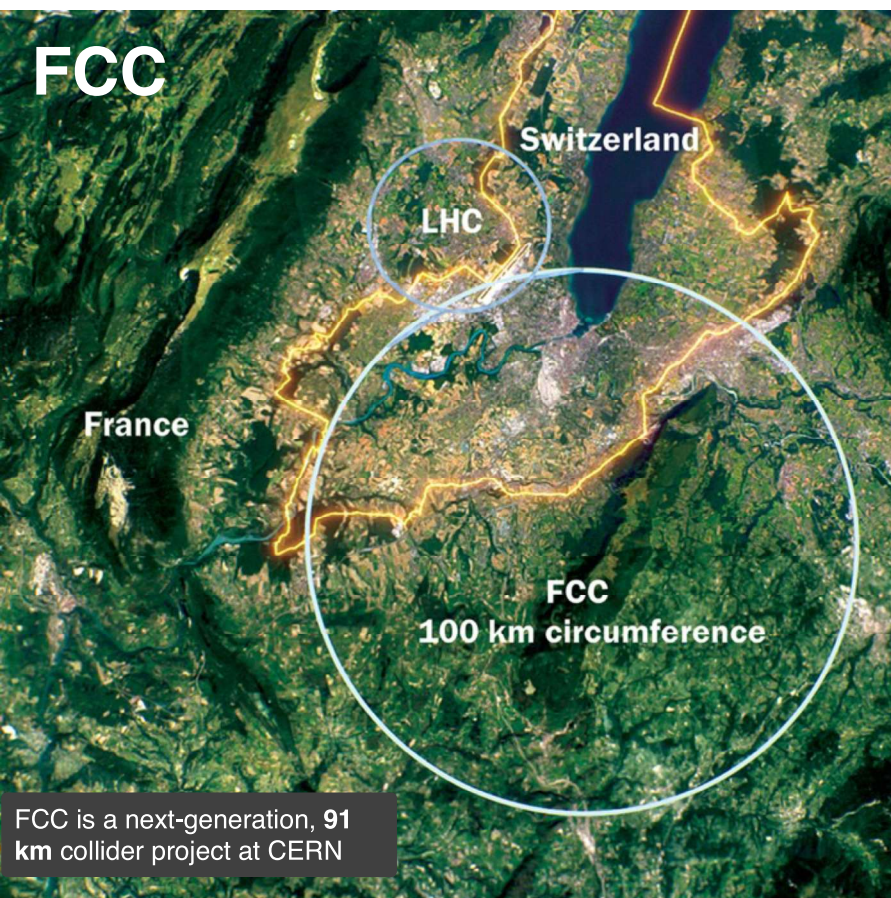


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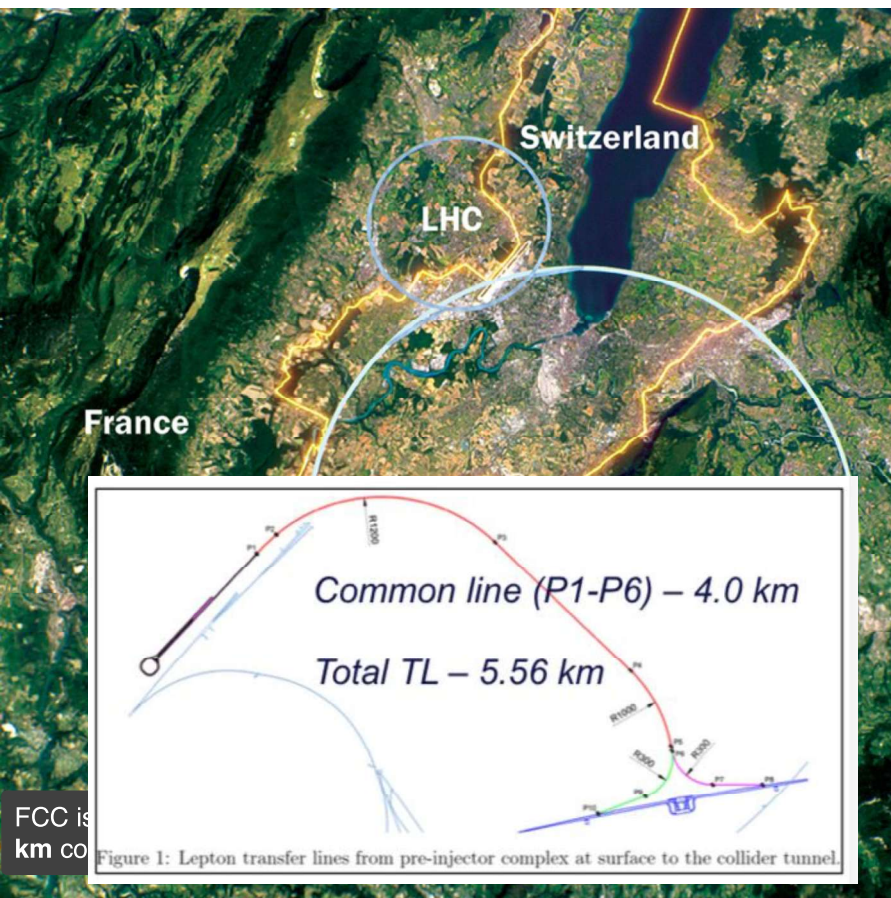


FCC



FCC is a next-generation, 91 km collider project at CERN





FCC

- Two stages
 - FCC-ee (precision measurements) about 15 years from the late 2040s
 - FCC-hh (high energy) about 25 years from the 2070s
- The FCC team is conducting the **feasibility analysis** and advancing the **conceptual design**.
- The **large scale** and duration of FCC open **unprecedented opportunities for Brazilian companies** across magnets, cryogenics, vacuum, power systems, precision mechanics, and controls.
- In particular, the transfer lines will require a large number of high-quality dipoles, quadrupoles and correctors.

Reference: Future Circular Collider Feasibility Study Report. March 2025

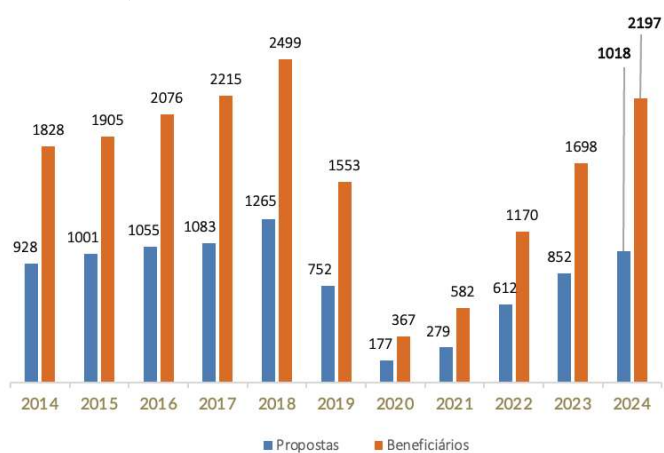
	Unit	Quadrupoles	Dipoles	Correctors
Total number		338	286x6=1716	224
# magnets in common line		162	192x6=1152	108
Length	m	1	1	tbd



Instalações Abertas



EVOLUÇÃO DO NÚMERO DE PROPOSTAS E BENEFICIÁRIOS (2014-2024)



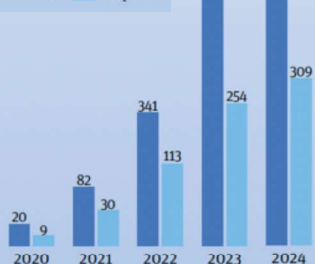
1.018
propostas atendidas

2.197
pesquisadores beneficiados



Sírius

Beneficiários Propostas



11 linhas de luz
receberam usuários externos

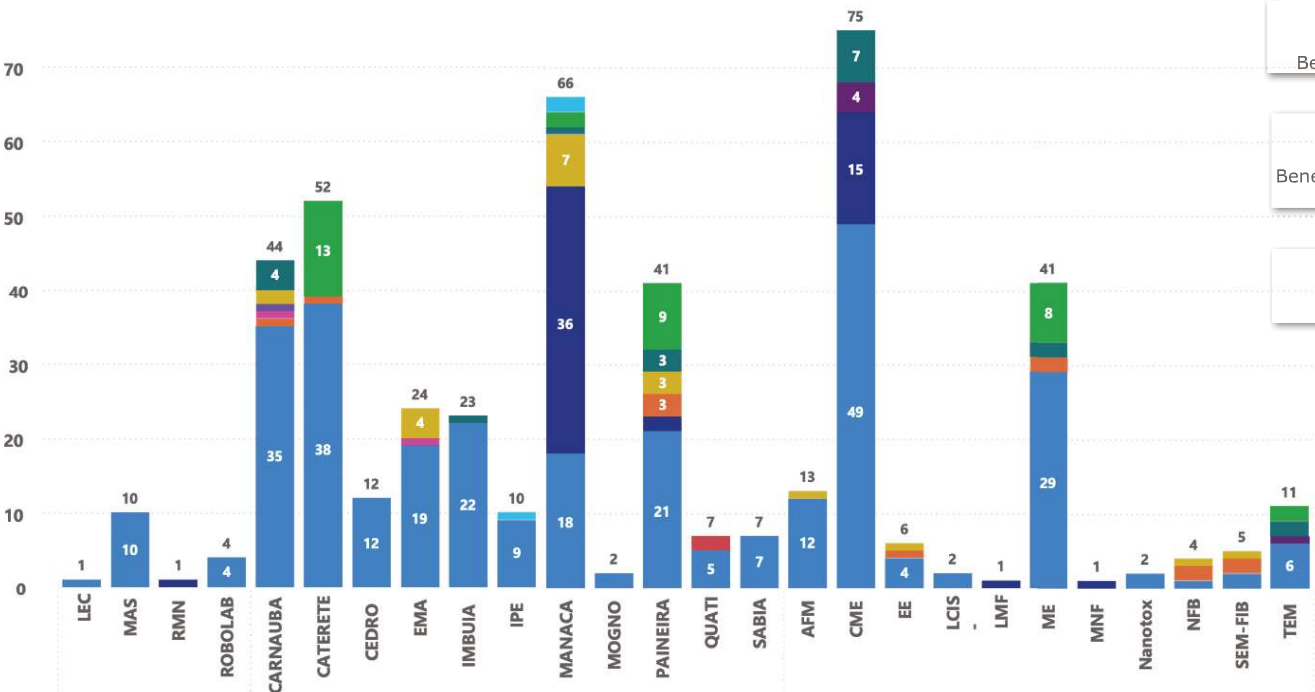
309 propostas de pesquisa externa
atendidas nas linhas de luz

1140 pesquisadores externos beneficiados
(59% Sudeste; 11% Sul; 9% Nordeste;
2% Centro-Oeste; 3% Norte; 16% Países Estrangeiros)

187 instituições
do Brasil e do exterior

Beneficiários por LN, Instalação e País de 2021 a 2025

País Argentina Chile Colômbia Cuba Equador Guatemala México Paraguai Peru Uruguai Venezuela



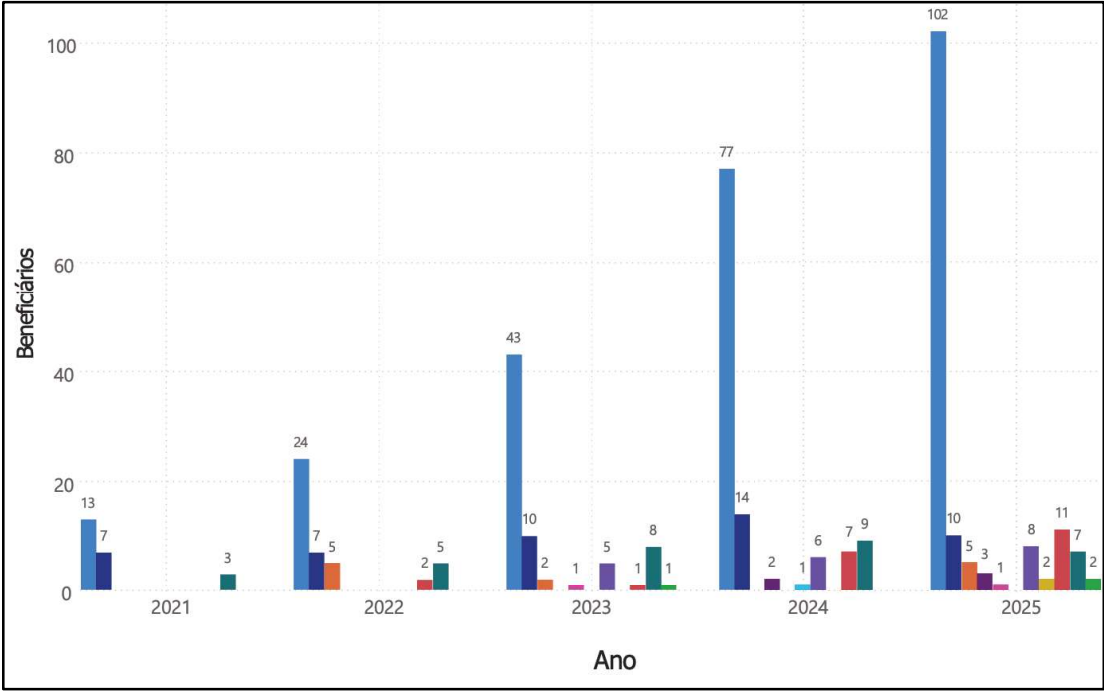
10 366
Beneficiários totais

404
Beneficiários da América Latina

11
Países

Instalação

Relativo a 2021 a Set/2025 / Gerado em Dez/2025



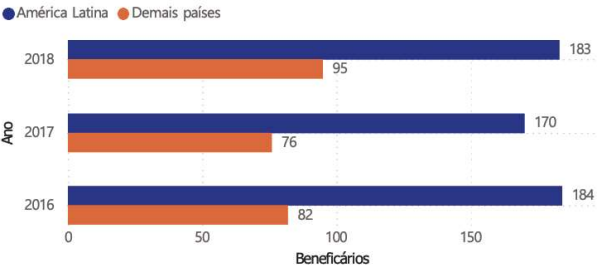
2021	2022
23	43
Beneficiários	Beneficiários
2023	2024
71	116
Beneficiários	Beneficiários
2025	
151	
Beneficiários	

Beneficiários - Síncrotron Comparativo UVX e Sirius

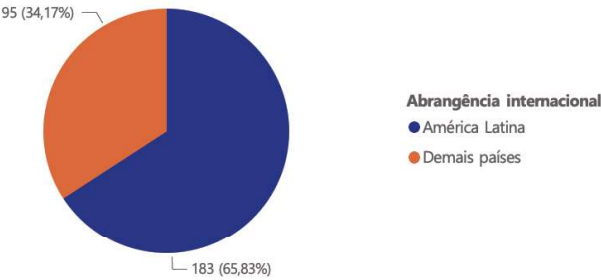
Relativo a 2021 a Set/2025 / Gerado em Dez/2025

UVX

Beneficiários por Ano e Abrangência internacional

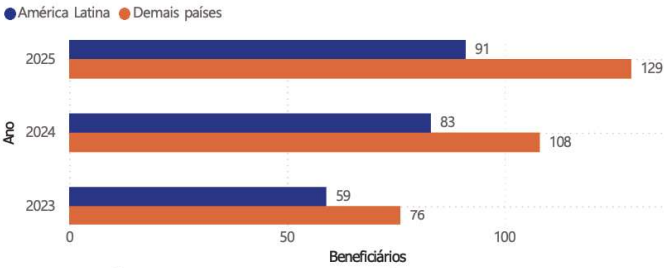


Abrangência internacional dos Beneficiários do UVX em 2018

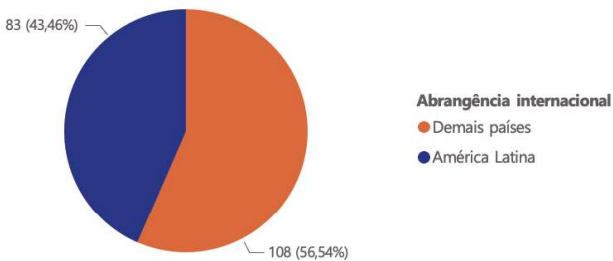


Sirius

Beneficiários por Ano e Abrangência internacional

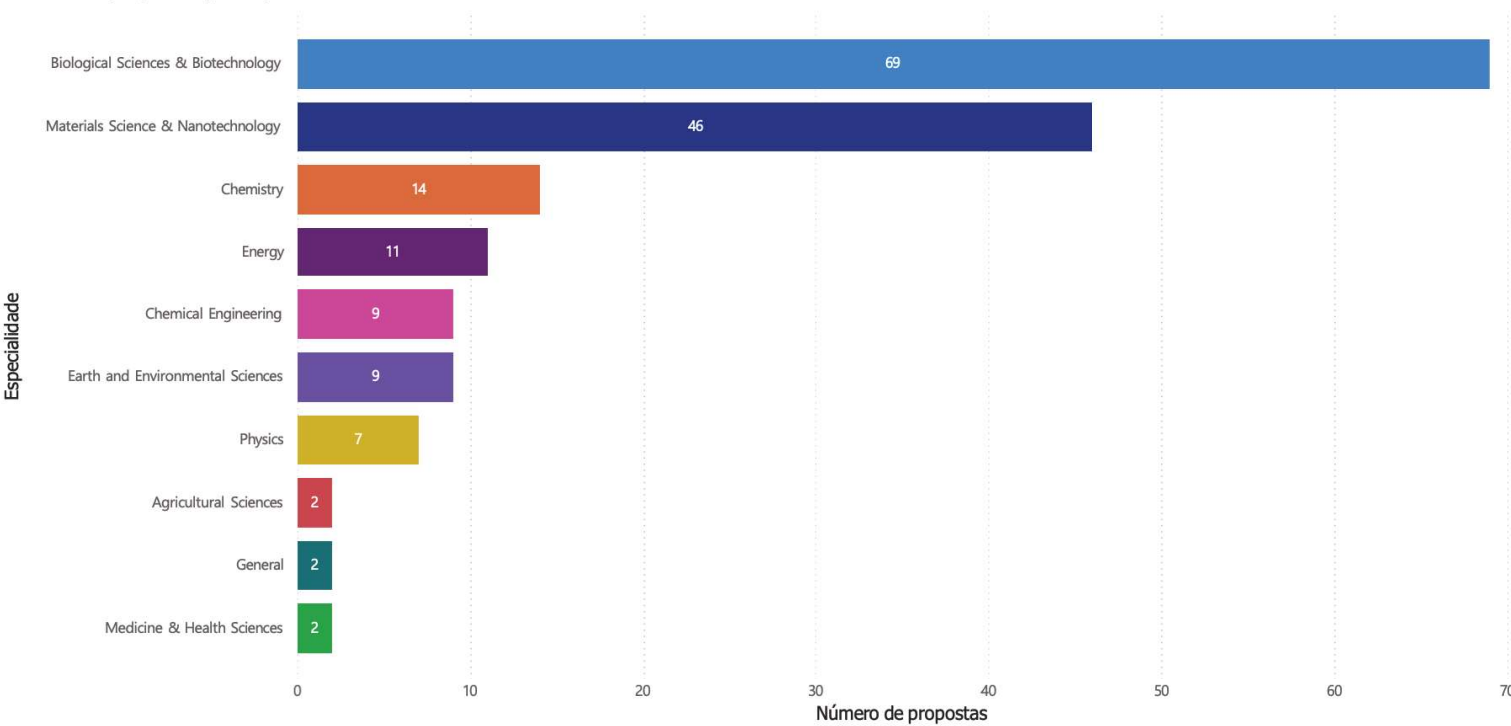


Abrangência internacional de Beneficiários do Sirius em 2024



Número de propostas por Especialidade

Relativo a 2023 a Set/2025 / Gerado em Dez/2025



Thank you



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