

# SnT 2023

CTBT: SCIENCE AND TECHNOLOGY CONFERENCE

HOFBURG PALACE - Vienna and Online

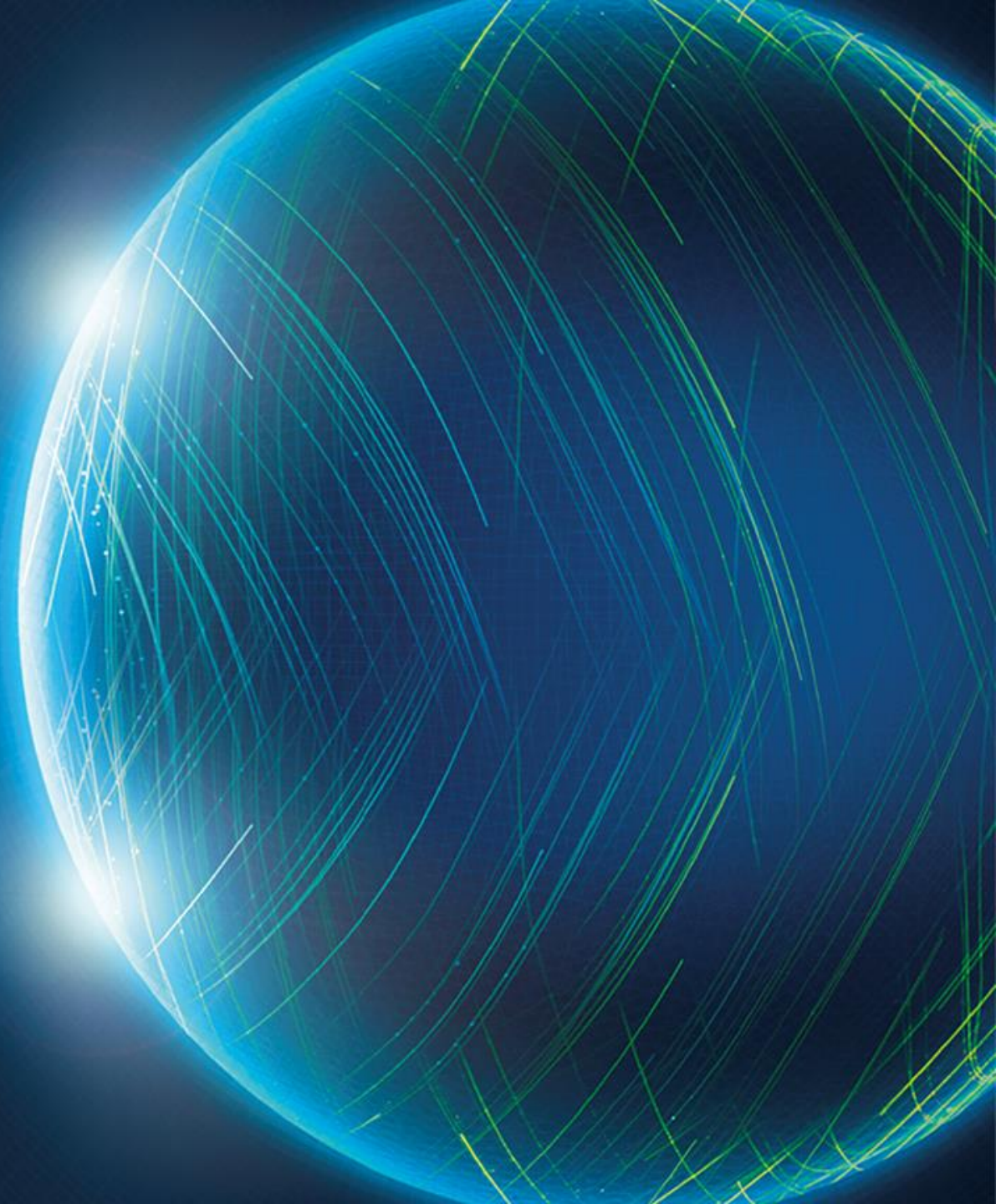
**19 TO 23 JUNE**

## **NDC Argentina: First year of Operation and Radionuclide Data Analysis**

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Autoridad Regulatoria Nuclear - ARGENTINA

05.3-404

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The Nuclear Regulatory Authority is the agency of the Argentine State dedicated to the regulation and control of nuclear activity, in the areas of radiological and nuclear safety, protection and physical security, and safeguards and non-proliferation.

The ARN's mission is to maintain an appropriate level of protection for people, the environment and future generations from the harmful effects of ionizing radiation.

To fulfill this mission, the ARN operates as the competent national authority for regulation and inspection in four regulatory areas, defined by the National Nuclear Activity Law:

- Radiation safety
- Nuclear safety
- Safeguards and non-proliferation
- Protection and physical security





The ARN acts as a "point of contact" before the CTBTO and is responsible for the operation and maintenance of radionuclide and infrasound monitoring stations and the laboratory that the Argentine National Government undertook to install in its territory.

The CTBT Unit is part of the Nonproliferation Policies and Institutional Affairs Department.

Head, Non-Proliferation Policies and Institutional Affairs Department: Mr. Pablo ZUNINO

Head of CTBT Unit:

Mr. Andrés Pantin

IMS Stations and NDC Coordinator:

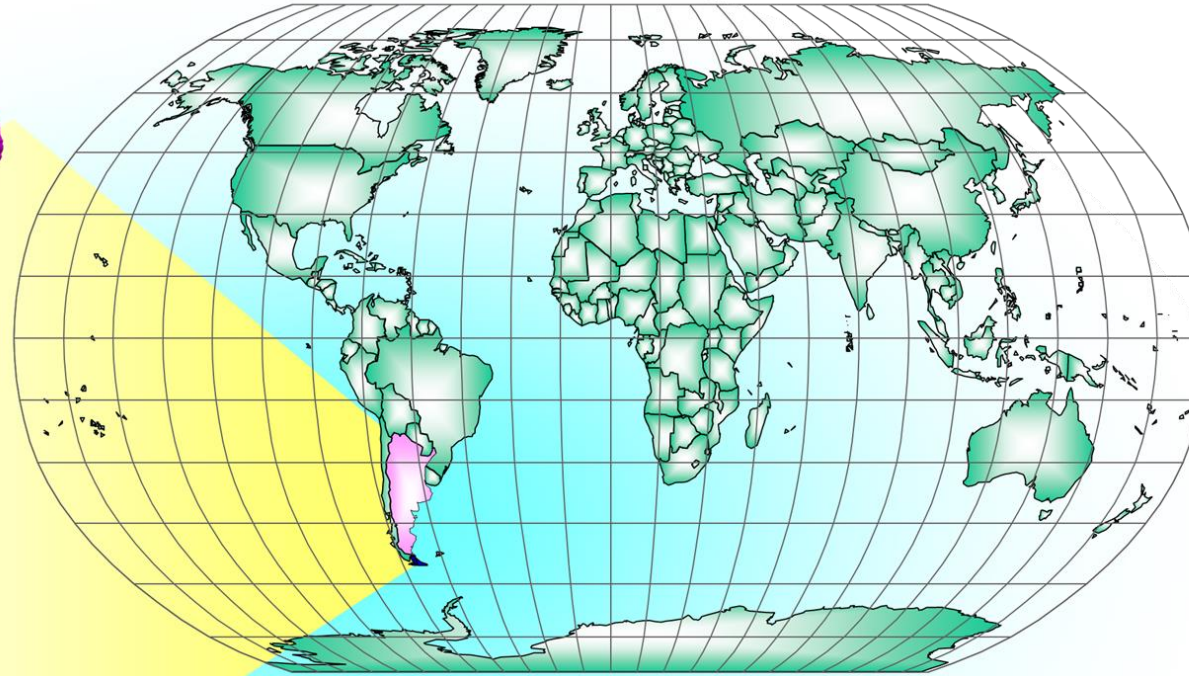
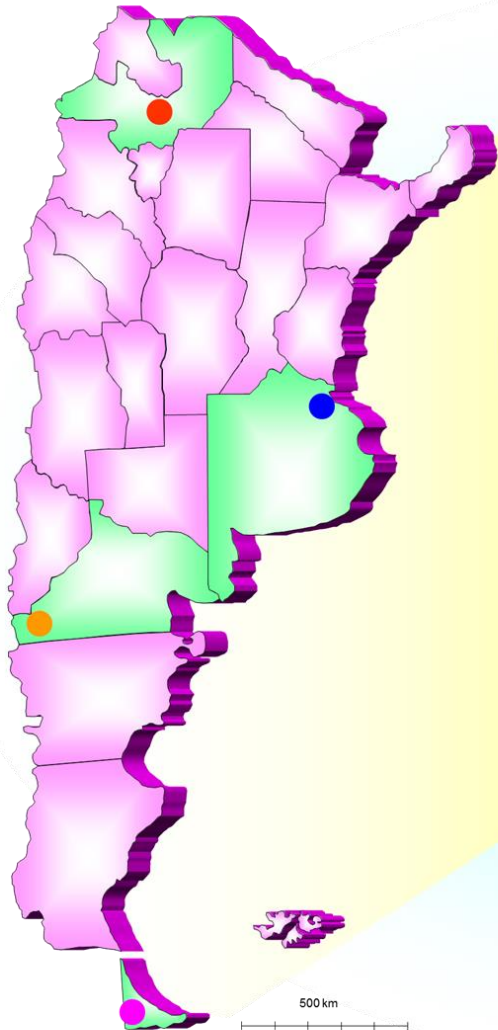
Mr. Marcelo Fernández

RN Laboratory Coordinator:

BS. Ezequiel Avaro



The CTBT Unit is in charge of the Operation and Maintenance of five stations of the International Monitoring System (IMS), a Radionuclide Laboratory and the Primary NDC for Radionuclide and Infrasound data analysis.



-  LABORATORY RL01 BUENOS AIRES
-  STATION RN01 BUENOS AIRES
-  STATION RN02 SALTA
-  STATION RN03 BARILOCHE
-  STATION IS01 PILCANIYEU
-  STATION IS02 USHUAIA

**RN01** – C.A.B.A.  
Radionuclide Station with NG Detection  
Capability  
Certificated september 29,2002

**RL01** – C.A.B.A.  
Radionuclide Laboratory.  
Certificated September 29,2005

**NDC** – C.A.B.A.  
Radionuclide and Infrasonic Analysis  
2021/22

**RN02** – Salta  
Radionuclide station  
Awaiting Certification

**RN03** – Bariloche, Rio Negro  
Radionuclide Station  
Certificated December 21, 2004

**IS01** – Pilcaniyeu, Rio Negro  
Infrasonic Station (8 elements)  
Certificated December 13, 2019

**IS02** – Tolhuin, Tierra del Fuego  
Infrasonic Station (5 elements)  
Certificated August 23, 2006

A National Data Centre is an organization working with Treaty verification under the guidance of, or as an integral part of, the National Authority and with technical expertise in the monitoring technologies.

“A data centre operated and maintained by a State Party whose functions may include sending IMS data to the IDC and/or receiving data and products from the IDC.” (Glossary to the draft IDC Operational Manual).



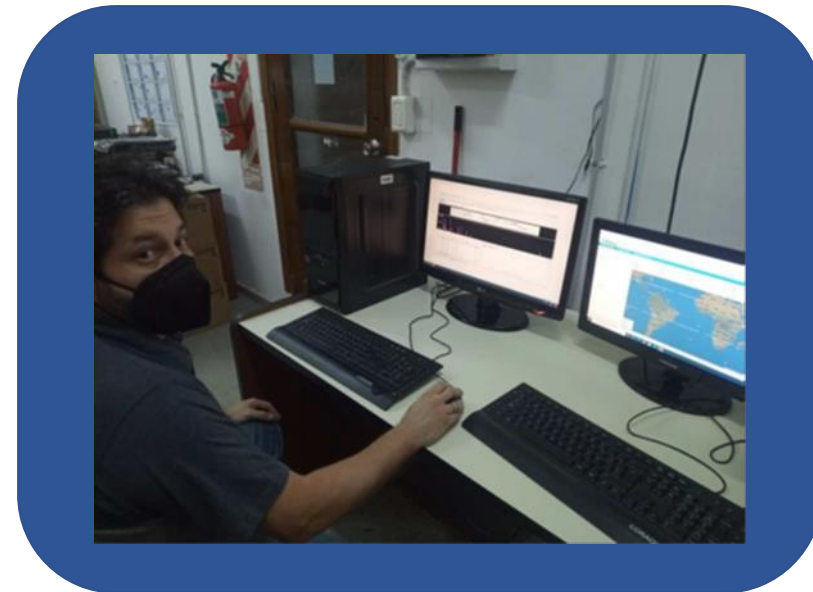
- Advise the National Authority by:
  - Verifying the nature of the events and the compliance with the Treaty
  - Reviewing proposed technical changes to the verification system
  - Providing technical advice to the representatives in the Executive Council
- Use IMS data and IDC products as needed to assist the verification efforts
- Provide scientific expertise to the technical subsidiary organs (Scientific Advisory Board, Working groups of scientific experts)
- Act as an interface to national scientific organizations and civil applications of the verification technologies
- Responsible for the proper use of IMS data and IDC products (confidentiality policy)

Having complied with the Argentine IMS network in accordance with the Treaty, the next milestone in the verification regime is to establish our own National Data Center (NDC) to access and analyze IMS Radionuclide and Waveform data.

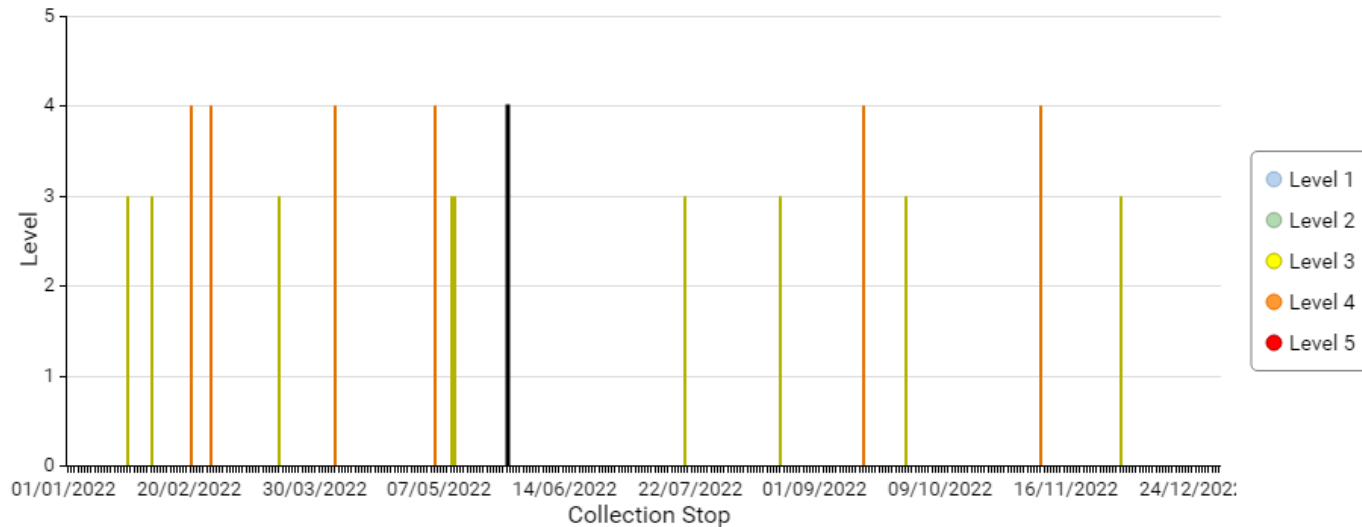
Using the tools provided by the IDC we start by collecting, storing, analyzing and sharing the data coming from our stations and in case of any event the data related will be re-analyzed and investigated.

## Software used at the NDC

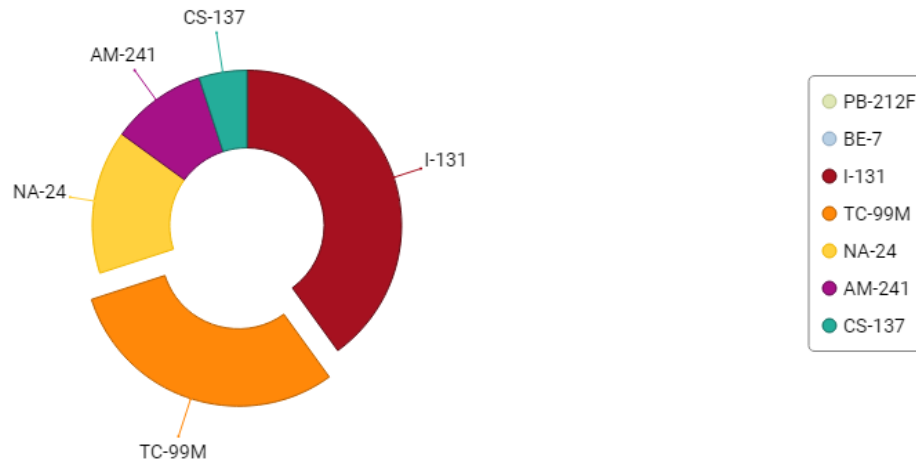
- NDC-in-a-box.
- RNToolkit.
- Performance Reporting Tool. (PRTool)



Categorization Time Series at ARP01 - Long term - Interactive analysis



CTBT detections at ARP01 - Interactive analysis



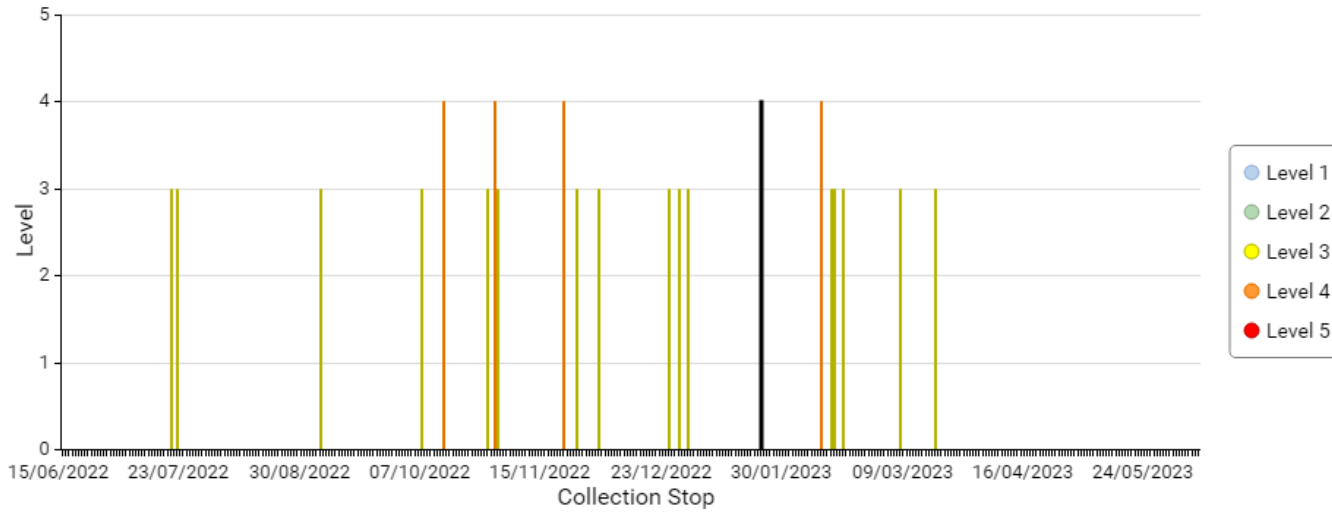
Detections at ARP01 Station, located in Buenos Aires, Argentina during 2022.

Detections of CTBT relevant nuclides

Nuclide	Half-life	Type of Product	Detections 2022
PB-212F	10.64 H	Natural	350
BE-7	53.22 D	Natural	350
I-131	8.040 D	Fission	8
TC-99M	6.010 H	Fission	6
NA-24	14.959 H	Activation	3
AM-241	432.2 Y	Fission	2
CS-137	30.100 Y	Fission	1



Categorization Time Series at ARP03 - Long term - Interactive analysis



CTBT detections at ARP03 - Interactive analysis



Detections at ARP03 Station, located in Rio Negro, Argentina during 2022.




Detections of CTBT relevant nuclides

Nuclide	Half-life	Type of Product	Detections 2022
PB-212F	10.64 H	Natural	359
BE-7	53.22 D	Natural	359
NA-24	14.959 H	Activation	16
CS-137	30.100 Y	Fission	5
RU-106	1.023 Y	Fission	1

- Collecting, storing and analyze RN raw data and data products coming from the IMS Stations.
- Detection levels trends.
- Data comparison between IDC and NDC for testing and capacity building purposes for analyst training.
- Produce RN Reports.
- Training of NDC Staff.
- Improvement/upgrade of NDC Equipment.

Three RN stations from Argentina plus one from Chile are being monitoring on daily basis using the tools provided by IDC for CTBTO relevant radionuclide detection in the four corners of the country.

**Radionuclide Stations Monitored by NDC Argentina**

Station Code	Responsible State	Location	Coordinates		Radionuclide Stations.	Radionuclide Stations with Noble Gas monitoring capability
			Lat.	Lon.		
ARP01*	Argentina	Buenos Aires	34.5 S	58.5 W		
ARP02	Argentina	Salta	24.8 S	65.5 W		
ARP03	Argentina	S.C de Bariloche	41.1 S	71.2 W		
BRP11*	Brasil	Rio de Janeiro	23.0 S	43.4 W		
CLP18	Chile	Punta Arenas	53.1 S	70.9 W		
CLP19*	Chile	Hanga Roa, Isla de Pascua	27.1 S	109.3 W		
FRP28	France	Pointe-à-Pitre Guadeloupe	16.3 N	61.5 W		
FRP31*	France	Kourou, Guyana Francesa	5.2 N	52.7 W		
PAP50*	Panamá	Panamá	9.0 N	79.5 W		
GBP67	United Kingdom	Santa Helena	15.9 S	5.7 W		
GBP68*	United Kingdom	Tristán da Cunha	37.1 S	12.3 W		
GBP69*	United Kingdom	Halley Antártida	76.0 S	28.0 W		
USP73	USA	Palmer Station Antártida	64.8 S	64.1 W		

\* Radionuclide Stations with Noble Gas monitoring capability



## What we expect for the future?

- Improve our capabilities through training courses and equipment upgrade.
- To cover the entire region of South America, Caribbean and Antarctica by monitoring 13 RN Stations.
- Cooperation and Interaction with other NDCs in the region.
- Share the data coming from our stations with educational Institutions for scientific research purposes.
- ... And enjoy our work

# Thank you for your attention!!!

## Questions?

Marcelo Alejandro Fernández  
IMS Station and NDC Coordinator  
Autoridad Regulatoria Nuclear - ARGENTINA