



MINISTRY OF RESEARCH, INNOVATION AND DIGITALIZATION



INSTITUTUL DE FIZICĂ ATOMICĂ
INSTITUTE OF ATOMIC PHYSICS

"Ar fi o fericire sa se inteleaga odata temeinic ca unul din factorii
cei mai importanti de formare economica a unei tari este
cercetarea stiintifica pura, [...] oricit de paradoxal ar parea la
prima vedere."

Horia Hulubei
Fondatorul IFA (1956)

Participation of Romania in CERN experiments

Florin-Dorian BUZATU,
Institute of Atomic Physics

11 January 2023

ifa : from the cradle of the Romanian **physics research**
to **funding agency** and **integrating role**



Horia Hulubei (1896-1972)
IFA founding father

- 2022/2023 DFG
- 2016 AUF & JINR (-> 2021)
- 2014 ELI-NP & FAIR
- 2012 EURATOM Fission
- 2011 CERN
- 2010 F4E (-> 2016)
- 2009 CEA (-> 2019) / Appl. host. ELI

International cooperation in atomic and subatomic field

- 2008 Re-organisation
- 2006 CEEC (-> 2008)

- 2001 CERES (-> 2006)
- 2000 EURATOM Fusion
- 1996 National R&D Institutes
- IFIN-HH, INFLPR, INFM, INFP spun off from IFA

1990 IFA (~~CSEN~~, ~~ICEFIZ~~ -> IFA), IRNE -> Min. El. Energy

1977 ICEFIZ (Re-organisation): ~~IFA~~, ~~IFB~~, ~~CMS~~, ~~Astr. Observatory~~

IFIN, IFTAR, IFTM, CFPS, CASS, FAN, IRNE Pitești,
ITIM Cluj-Napoca, CFT Iași

1973 ICEFIZ: IFA, ITN Pitești, I. Iz. St. Cluj, IFB, INCREST, Lab. Fiz. CCTF Iași

1968 IFA → CEN

1956 IFA (Inst. At. Phys.) IFB

1949 Inst. Phys. Acad.





Romania and CERN



- ❑ Since the early 1990s direct collaboration with CERN
- ❑ December 2008: CERN Council granted Romania the status of **Candidate for Accession to Membership**
- ❑ 11 February 2010: **Romanian Minister** of Education, Research, Youth and Sport, Daniel Petru Funeriu, and CERN Director General, Rolf Heuer, **sign an agreement that formally recognizes Romania** as a Candidate for Accession to Membership of CERN.
- ❑ 13 October 2010 **agreement was unanimously ratified by the Romanian parliament.**
- ❑ Romania became **CERN's 22nd Member State** on 17 July 2016;
- ❑ Romania's flag raised at CERN on 5 September 2016; His Excellency Mr. Klaus Werner Iohannis, **President of Romania** and Fabiola Gianotti, Director General at CERN;
- ❑ Visit of the **Romanian Minister** of Research and Innovation of Romania, Nicolae Hurduc, at CERN on 27 November 2018;
- ❑ RECFA visit to Romania on 23 March 2018.



Current involvement in 11 CERN experiments

LHC:



Basic building blocks of matter; fundamental forces; Higgs boson; physics beyond the Standard Model, super-symmetry.



Heavy-ion physics; strongly interacting matter at extreme energy densities; quark-gluon plasma.



antimatter asymmetry; "beauty quark".



GRID computing



Magnetic monopole; exotic particles.

Significant contributions to detectors, readout electronics, GRID computing, data analysis and physics

SPS:



Rare kaon decays; CKM mixing matrix.



Tau neutrino decay; lepton flavour universality.

PS:



Pulsed neutron source; neutron-nucleus interactions; time-of-flight measurements



Radioactive ion-beams; exotic nuclei; nuclear structure and models

Neutrino Platform:



ProtoDUNE-DP

Neutrino physics

R&D:

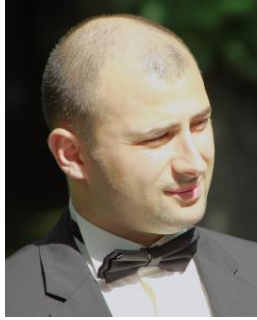


Hard semiconductor devices for very high luminosity colliders

Team leaders of the 12 current projects



Prof. Mihai
PETROVICI, IFIN-HH



Dr. Alexandru Florin
DOBRIN, ISS



Prof. Călin ALEXA
IFIN-HH



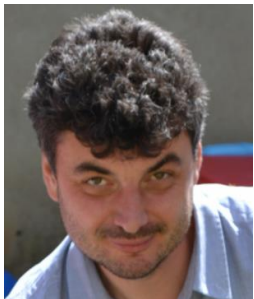
Dr. Florin MACIUC
IFIN-HH



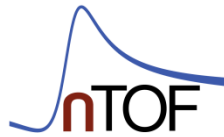
Dr. Mihnea DULEA
IFIN-HH



Dr. Vlad POPA
ISS



Dr. Constantin MIHAJ,
IFIN-HH



Dr. Alexandru
NEGREȚ, IFIN-HH



Dr. Alexandru Mario
BRAGADIREANU, IFIN-HH



Prof. Ionel LAZANU
UB-FF

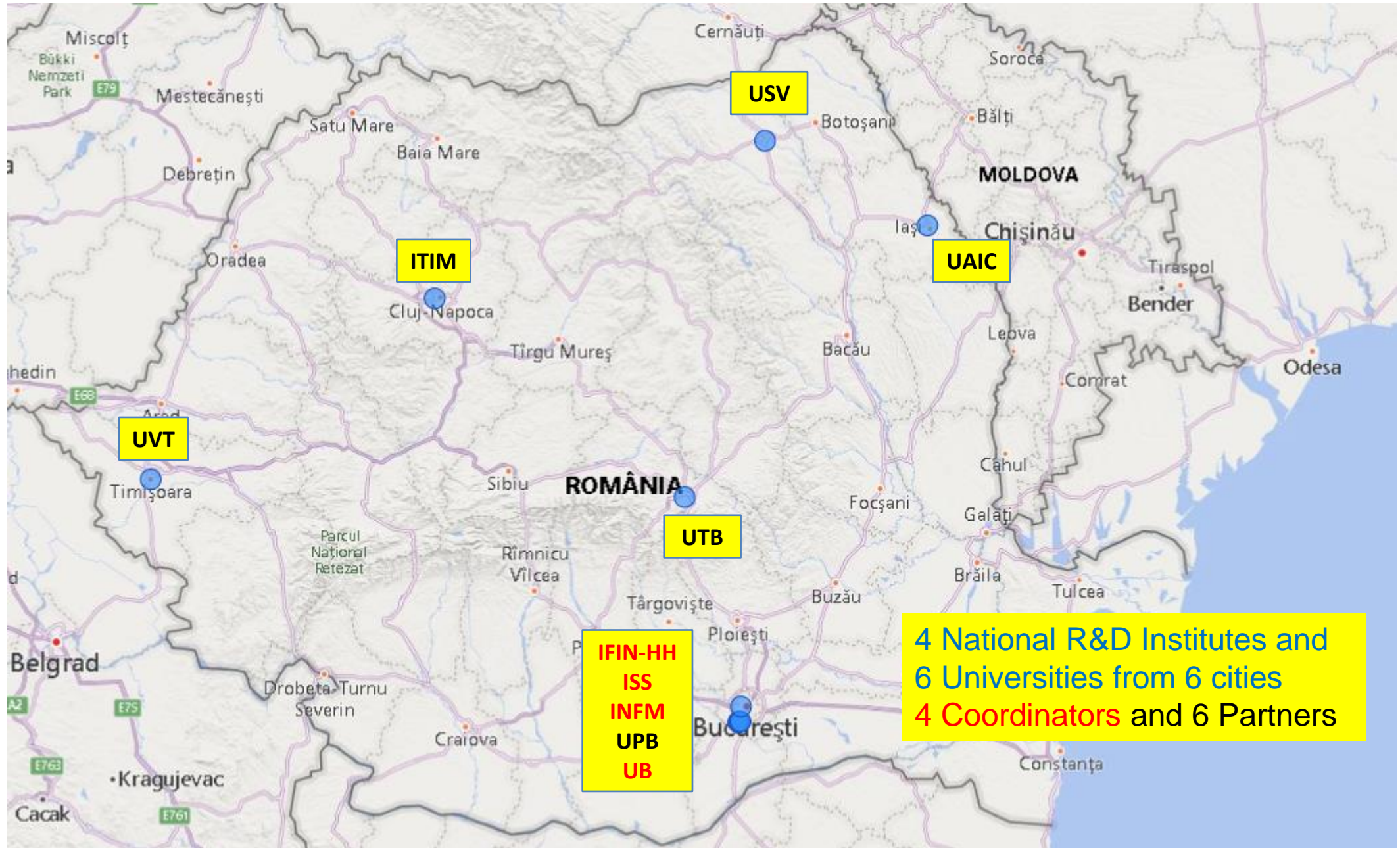


Dr. Ioana PINTILIE
INFM



Dr. Elena FIRU
ISS

Geographical distribution of the Romanian institutions participating in CERN experiments



International Scientific Advisory Board (ISAB)

ISAB members:

Dr. Cristinel DIACONU - *Chair*
CPP Marseille, CNRS, France
(2011)

Dr. Christian JORAM
CERN Physics Dept. (2019)

Prof. John HARRIS
Yale Univ., USA (2011)

Prof. Thomas LOHSE
Humboldt Univ., Germany (2016)

Prof. Clara MATTEUZI
INFN, Milano Univ., Italy (2015)



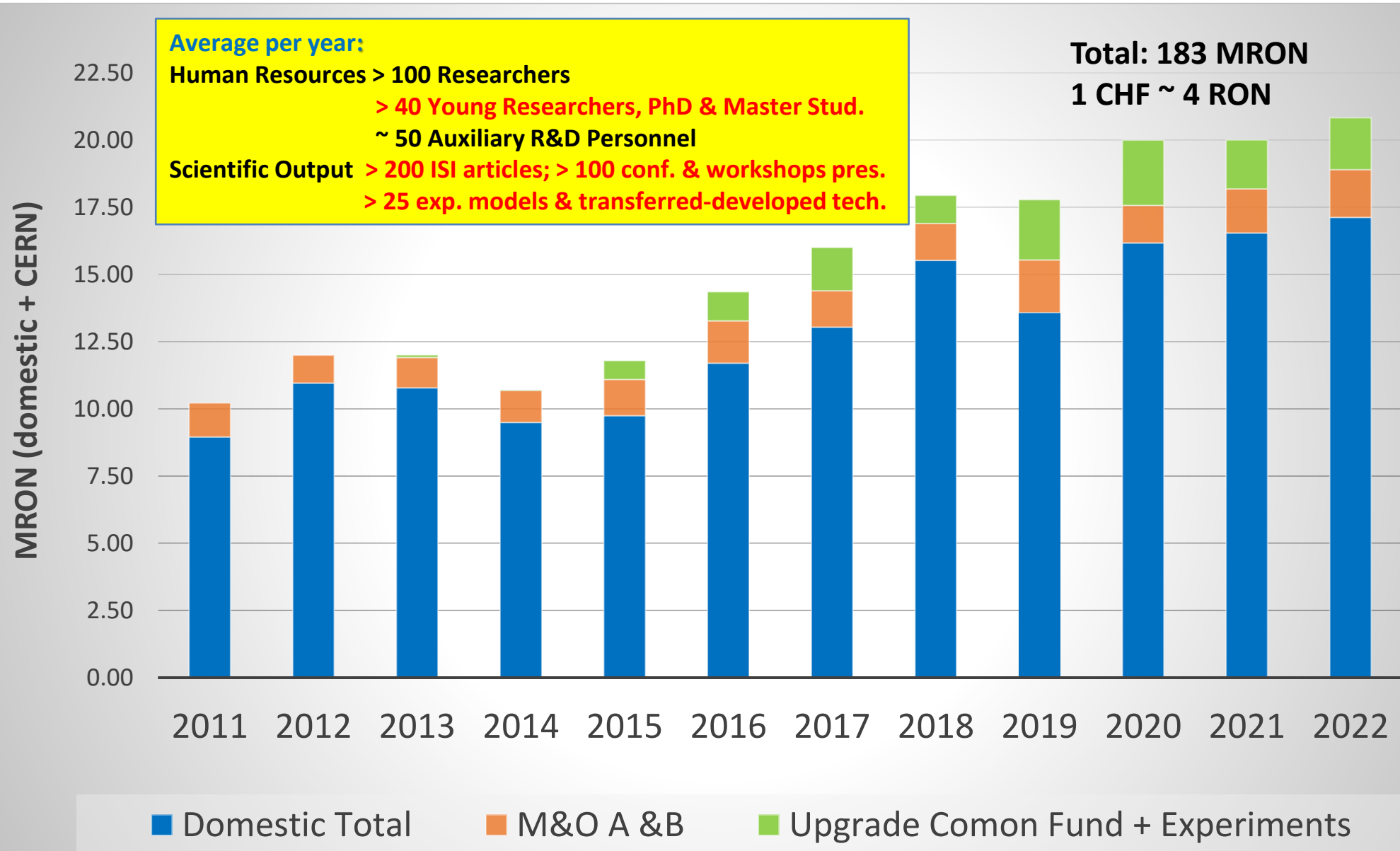
Former members:

Dr. Philippe BLOCH
CERN Physics Dept. (2011-2017)

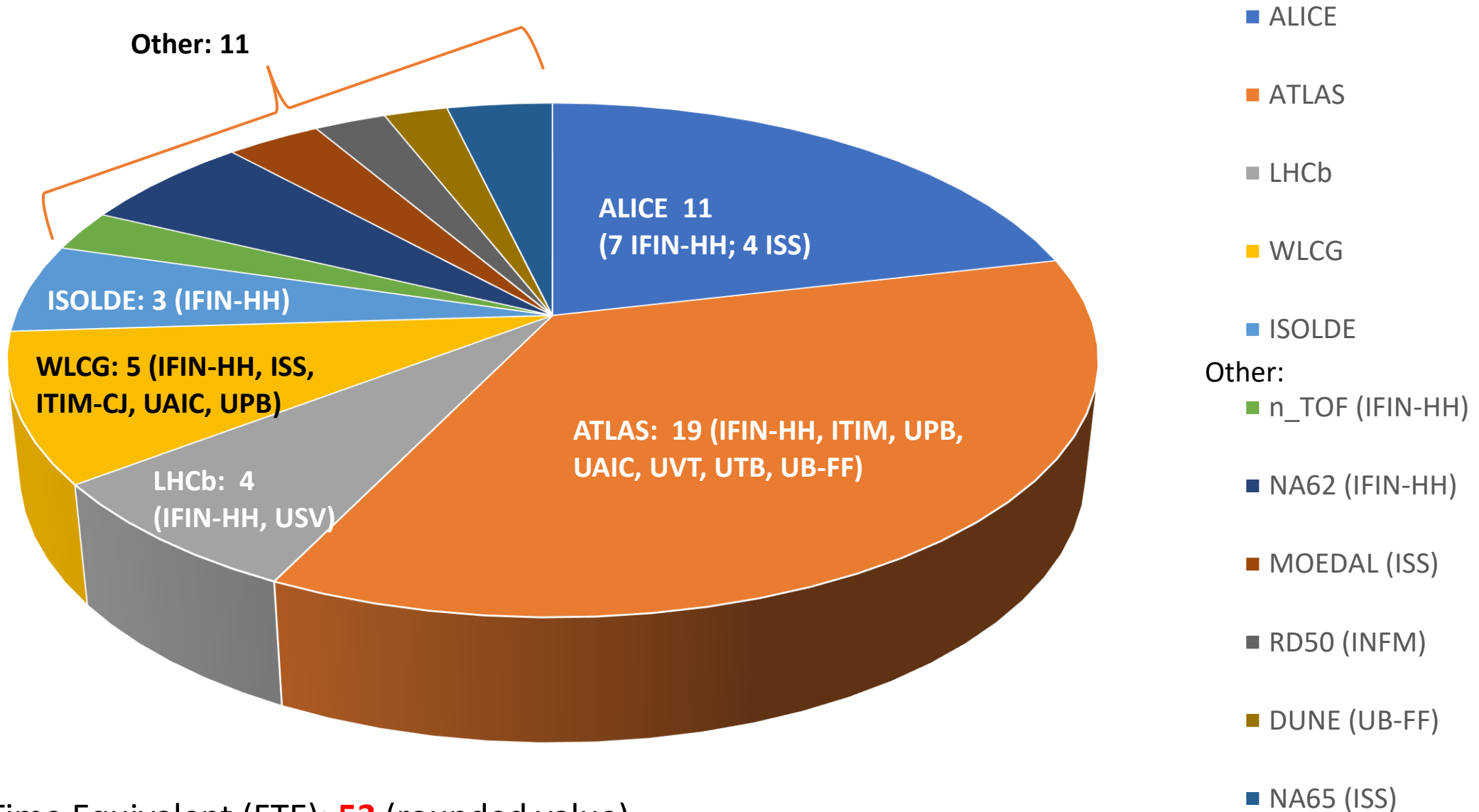
Prof. François LE DIBERDER
Univ. Paris VII, France (2011-2014)

Dr. Eckhard ELSEN
DESY, Germany (2011-2015)

Funding & Scientific Output of Romanian participation in CERN experiments



FTE per CERN Experiment 2022



Full Time Equivalent (FTE): **53** (rounded value)

Participants: **217** (ATLAS 87; ALICE 27 - 18/IFIN-HH + 9/ISS; ISOLDE 24; WLCG 24; LHCb 15; Other 40)

Dissemination & Outreach

ANCS 2009-2011

ANCS 2012

ANCSI 2009-2015

Romanian research projects at CERN 2016 - 2019

Bucharest-Magurele, ROMANIA 2021

2022 - ISS@RN



Simpozion ifa Institutul de Fizică Atomică PROGRAMUL CERN-RO 2018

Simpozion ifa Institutul de Fizică Atomică PROGRAMUL CERN-RO 2019

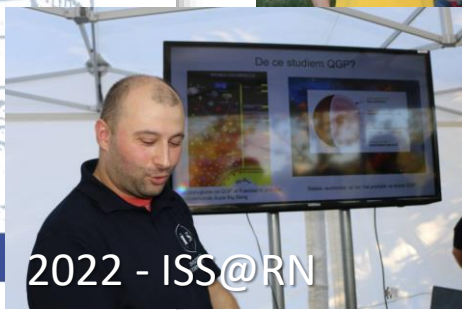
Simpozion ifa Institutul de Fizică Atomică PROGRAMUL CERN-RO 2021

Realizări și perspective ale participării României la experimentele CERN

17 Noiembrie 2021, 16:00 – 11:30 Sesiune de comunicare dedicată tinerilor

Eveniment ONLINE, Zoom Meeting ID: 87836949985, Passcode: 00684771

ATLAS	IFIN-HH (Conducător proiect), IFIM-CI, UPR-UIAG, USV, UIB, UBT, UBT-II, Partenerii
LHCb	IFIN-HH (Conducător proiect)
ALICE	IFIN-HH, ESS
n-TOP	IFIN-HH
1625 - 1810 WLCG	IFIN-HH (Conducător proiect)
ISOLDE	IFIN-HH
NA62	IFIN-HH
RD 50	INFN
RD-DUNE	US-ET
RD-WOEDAL	ESS
NA65	ESS





Thank you!

IFA – a living legend that has to continue!

www.ifa-mg.ro