

## COMMUNICATION AND OUTREACH

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The Education and Public Outreach Service (EPOS) of LNF fosters the scientific literacy through a wide programme of initiatives addressed to students, teachers and general public to bridge science and society, either inside or outside the LNF site. The main mission is to engage the public with science, inform about the latest issues in research conducted by INFN-LNF and the collaborations, enhance the valorization of scientific heritage and building network with the society. The Service includes many activities: communications (web and social), press and media relations, multimedia, graphics and photos, public events and visits, student and teacher programmes. Due to the Covid-19 emergency, starting from March 2020 the activities have been adapted and carried out online.

### 1 Student programme

EPOS-LNF offers different types of activities to raise awareness, curiosity and passion towards science and its applications to society among young people. In some of these initiatives pupils work together with LNF researchers in laboratory-based activities, having the chance to experience life inside a research centre. These events represent an unique opportunity for High School students that could help in the choice of higher education or career. The activities can be recognized in terms of work-related learning project.

#### 1.1 [EDU]kids and INFN Kids

[Edu]kids is the science education programme dedicated to pupils attending the Primary and Lower Secondary Schools that aims to increase the interest of young generation towards the fascinating world of Particle Physics. In January/February 2020 LNF hosted 420 students in the project "Io dico l'Universo" that includes: guided tour of LNF, meeting a researcher at LNF.

In May we organized "L'Universo in tasca", a series of 6 webinars addressed to students of the Lower Secondary Schools dedicated to the latest issues on modern Physics.

Within the INFN Kids project in collaboration with Rai Radio Kids, in July we organized the summer camp "Le mie gigapano vacanze estive", 10 webinars with stories and science demonstrations addressed to kids aged 8-11 years.

[lnf.infn.it/edu/kids/](http://lnf.infn.it/edu/kids/)  
[edu.lnf.infn.it/luniverso-in-tasca/](http://edu.lnf.infn.it/luniverso-in-tasca/)  
[bit.ly/INFNKids\\_summercamp](https://bit.ly/INFNKids_summercamp)

#### 1.2 Matinées di scienza - Science Matinées

The event is dedicated to High School students attending the last year and consists in lectures on Modern Physics including experiment-based demonstrations. In 2020 these lectures were proposed to 185 students coming from all over Italy, in January and February. Each lesson lasts 3 hours and

students received a certificate of attendance. The topics of the lectures are: bionanotechnologies and superconductivity.

[edu.lnf.infn.it/matinees-di-scienza-2020/](http://edu.lnf.infn.it/matinees-di-scienza-2020/)

### 1.3 International Day of Women and Girls in Science

For the International Day of Women and Girls in Science, 11th of February, established by the UN General Assembly to promote STEM careers (Science, Technology, Engineering and Mathematics), LNF organized a special "Matinée di Scienza" (Science Matinée) addressed to 150 High School students in their last years in which women in science talked about their experiences and careers.

[edu.lnf.infn.it/international-day-of-women-and-girls-in-science-2020/](http://edu.lnf.infn.it/international-day-of-women-and-girls-in-science-2020/)

### 1.4 INSPYRE INternational School on modern PhYsics and REsearch

INSPYRE - INternational School on modern PhYsics and REsearch, Challenges in Quantum Physics and Technologies is a course dedicated to the latest issues of Modern Physics addressed to students in their last two years of High School. The 2020 edition was held online and forecast on the LNF INFN YouTube channel.

Number of registered students 105.

[edu.lnf.infn.it/inspyre-2020/](http://edu.lnf.infn.it/inspyre-2020/)



Figure 1: *This picture displays a group of students during the International Day of Girls and Women in Science.*

### 1.5 Summer School

The Summer internship is open to students who attended their fourth year in High School and includes lectures and hands-on activities. The 2020 online edition has been devoted to Particle Physics and it has been structured in lectures, experimental demonstrations, a virtual visit to the Dafne accelerator complex and QA sessions. 560 students registered at the online edition.

[edu.lnf.infn.it/summer-school-2020](http://edu.lnf.infn.it/summer-school-2020)

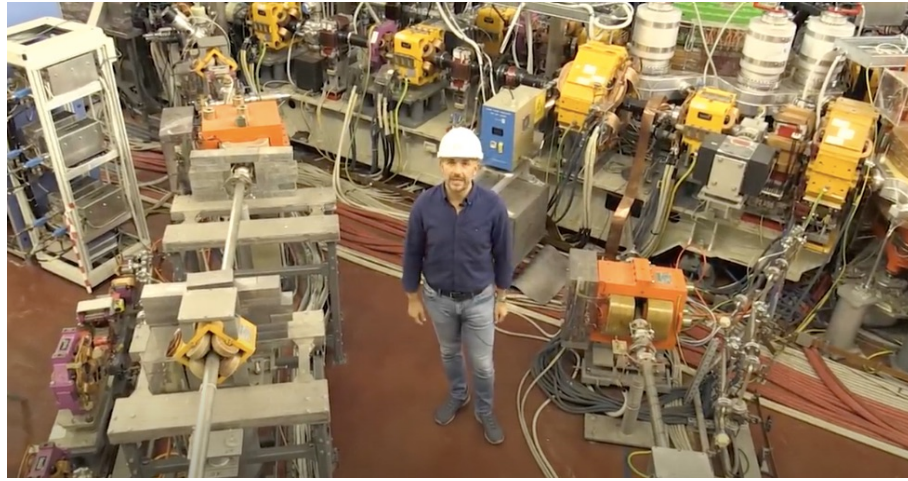


Figure 2: A picture taken during the virtual visit at Dafne organized for the Summer school.

## 1.6 Researchers @School

LNF researchers held several lectures in Primary and Secondary Schools and Universities. The topic of these lectures deal with General Physics and Modern Physics. In some of these lectures laboratory-based activities are presented and students have the chance to carry out hands-on experiments. 800 students attended these lectures in 2020 during January/February.

[edu.lnf.infn.it/archivio-seminari-divulgativi-2020/](http://edu.lnf.infn.it/archivio-seminari-divulgativi-2020/)

## 1.7 Researchers @Home

In April/May 2020 a series of 6 webinars devoted to the main issues in Modern Physics and presented by INFN-LNF researchers has been forecast on the LNF YouTube channel.

P.Gianotti - La rivoluzione della fisica moderna

D.Domenici - Il laboratorio dei raggi cosmici

B.Sciascia - I quark e l'ultimo dei bosoni

G.Mazzitelli - A caccia della materia oscura

D.Domenici - Dai buchi neri alle onde gravitazionali

C.Curceanu - Dai laboratori alla societ 

More than 3100 total views during the live events.

[bit.ly/researchersathome20](https://bit.ly/researchersathome20)

## 2 Teacher programme

This programme consists in two courses addressed to Science Teachers who want to deepen their knowledge in the fields of Physics and Technology.

### 2.1 Incontri di Fisica - Physics Meetings

Physics Meetings is a refresher course on Modern Physics. The course lasts three days (4-6 November 2020). The goal is to stimulate the teachers professional training and provide an occasion for interactive participation in the latest developments in Physics.

The 2020 programme included lectures and experimental demonstrations carried out by INFN researchers and the online course offered by the University Marconi.

Teachers, authorized by the Minister of Education, received a certificate of attendance. In the case of IDF course 2.0 in blended modality, the University Marconi, partner of this event, also 6 University credits were released. All the programmes are published on AccendiScienza web site (lessons, videos, photos).

There were 93 participants in 2020.

[lnf.infn.it/edu/incontri/2020/index.php](http://lnf.infn.it/edu/incontri/2020/index.php)

### 3 General public

This programme consists of public seminars given by LNF researchers, guided tours addressed to people passionate about science and people who want to discover science and the places in which it is investigated.

#### 3.1 Bruno Touschek Visitor Centre and Guided Tours

During the year it is possible to visit the Bruno Touschek Visitor Centre, the outreach hub dedicated to the history of LNF. The visits are guided by LNF researchers who present the exhibition and interact with people answering their questions. This visit can be included inside a longer itinerary which includes a stage dedicated to the Dafne control room and a stage at KLOE experimental site. 200 people visited LNF in January/February 2020.

[visitorcentre.lnf.infn.it](http://visitorcentre.lnf.infn.it)

#### 3.2 European Researchers' Night

The European Researchers' Night is an initiative created in 2005 by the European Union which aims at promoting valuable occasions of meeting between science and society in enjoyable and bracing contexts. For 2020 LNF proposed an online guided tours of the Bruno Touschek Visitor Centre addressed to kids. This year the event was held in November 27th with a presence of 55 visitors.

<http://bit.ly/LNFern>

#### 3.3 Public seminars

LNF researchers gave several lectures either at LNF site or in public places like libraries. 300 people took part to these events.

From July to December 2020 we organized three cycles of online lectures, namely: Fisica in una notte di mezza estate - 2 webinars, Un tuffo nel mistero (in collaboration with Cosenza group) - 4 webinars and Pomeriggi di Scienza - 5 webinars.

#### 3.4 AccendiScienza - e-learning for science dissemination

AccendiScienza is a tool for e-learning and scientific culture diffusion. The platform, financed by MIUR (Ministry of Education, Universities and Research) has been completed thanks to the collaboration with Consorzio GARR and University Marconi. Created to collect and freely make available lessons and seminars held at LNF, this web-portal contains four sections dedicated to its different targets: high school teachers, students, general public, young people. The main goal of the portal is to enhance and give more extensiveness to the activities organized every year by the Laboratory here in Frascati by enabling remote participation too. In addition, it will be a valuable support to traditional scientific teaching and education.

Videos : 249

Users : 1413

Views : 31256

`accendiscienza.lnf.infn.it`

## 4 Communication

The Communication office aims to create and distribute informational contents concerning the ultimate issues related to LNF experiments and collaborations, moreover it enhances the valorization of LNF scientific heritage. The principal communication activities are on the website and on socials.

### 4.1 Web Editorial board

The LNF Web Editorial board role is to improve the development of web content in order to keep the website constantly up to date. The Editorial Board is made of representatives of all the LNF divisions, services and the Director and provides for the collection, editing and publication of the various news, dissemination articles and other texts and communications addressed both to the general public and the LNF personnel.

`cdrweb.lnf.infn.it`

### 4.2 Social media

LNF fosters public engagement with science via social media and is currently active on Facebook, Twitter, Instagram and YouTube.

Facebook @lnf.infn.it

Twitter @infn\_lnf

Instagram @lnf\_infn

YouTube [youtube.com/user/INFNLNF](https://www.youtube.com/user/INFNLNF)

## 5 List of Conference Talks in Year 2020

1. S. Bertelli *et al*, "EXPERIENCES IN INSPYRE: INTERNATIONAL SCHOOL ON MODERN PHYSICS AND RESEARCH", 14th International Technology, Education and Development Conference Valencia, Spain. 2-4 March, 2020.
2. G. Gadda, M. Andreotti, M. Andreotti, I. Balossino , P. Bernardoni, M. Boschetti, G. Cibinnetto, E. Diociaiuti, D. Domenici, R. Donghia, B. Fabbri, S. Fugattini, A. Impallaria, G. Mezzadri, E. Spagnoli, M. Soldani, M. Valt, S. Bertelli "FILINGS: divulgazione inclusiva della fisica", 106 Congresso Nazionale Societaliana di Fisica, 14-18 settembre 2020.

## 6 Publications

1. S. Bertelli *et al*, "EXPERIENCES IN INSPYRE: INTERNATIONAL SCHOOL ON MODERN PHYSICS AND RESEARCH", (2020). INTED 2020, 14th International Technology, Education and Development Conference Valencia, Spain ISBN: 978-84-09-17939-8 / ISSN: 2340-1079 doi: 10.21125/inted.2020, Publisher: IATED.
2. S. Bertelli *et al*, "The Frascati National Laboratory Visitor Centre: a journey through the history of particle physics", Atti del XXXIX Convegno annuale della SISFA (Pisa, September 9-12, 2019), La Rana A., Possi P. (eds). Pisa: Pisa University Press, 2020.

## **7 Acknowledgements**

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Table 1: *Student programme overview*

<b>In person event</b>	<b>Number of participants</b>
EDUkids	420
Matinée di scienza	235
Researchers @school	750

<b>Online event</b>	<b>Live Views</b>	<b>Views on 1st May 2021</b>
INSPYRE	1340	14750
Researchers @Home	3100	107000
L'Universo in tasca	2360	43600
Summer School	4000	44000
INFN Kids Summer camp	550	7500

Table 2: *Teacher programme overview*

<b>Event</b>	<b>Number of participants</b>
Incontri di Fisica	93

Table 3: *General public programme overview*

<b>In persone event</b>	<b>Number of participants</b>
Public lectures	140
Guided tours - Visitor Centre	200

<b>Online event</b>	<b>Live views</b>	<b>Views on 1st March 2021</b>
Un tuffo nel mistero	200	6200
Fisica in una notte di mezza estate	140	7150
European Researchers' Night	55	2000
Pomeriggi di Scienza	600	15700