

European Researchers' Night: the INFN experience in Italy

Livia Soffi^a

^a*Istituto Nazionale di Fisica Nucleare,
Piazzale Aldo Moro 2, Rome, Italy*

E-mail: livia.soffi@roma1.infn.it

The European Researchers' Night stands as a beacon of scientific outreach and engagement. It unfolds as a platform for dialogue, enabling researchers to share their passion and latest breakthroughs with a diverse audience. In this talk, we delve into the journey of the Italian National Institute for Nuclear Physics (INFN) within this prestigious event. The INFN obtained so far a large number of financed projects and this contributed to the diffusion of the initiative throughout the national territory. With a focus on fostering the interaction between researchers and the public, our participation offers a kaleidoscope of engaging activities and enlightening discussions. Through interactive exhibits and hands-on experiments, the INFN showcases the intricacies of particle physics, inviting attendees to embark on a journey of scientific discovery. We describe our experience by including suggestions for improving the success of involvement in Researchers' Night also in other countries.

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1. Introduction and Overview

The European Researchers' Night (ERN) in Italy is a cornerstone in the mission of the National Institute of Nuclear Physics (INFN) in Italy to bring research and researchers closer to the public through engaging science activities[1]. In this document the impact made, and the innovative activities that are helping inspire the next generation of scientists are discussed.

The European Researchers' Night is an annual event held on the last Friday of September, attracting over 1.5 million visitors across Europe. Funded by the Marie Skłodowska-Curie Actions[2], this event combines education with entertainment through various exhibitions, hands-on experiments, and science shows. The goal is to engage the public, especially young people, in the STEAM fields—science, technology, engineering, arts, and mathematics—by showcasing the exciting and impactful work of researchers.

2. ERN Projects in Italy

The INFN has been leading several ERN founded projects across Italy since 2013, starting with SHARPER [3], the first and largest project. Since then, other projects have been initiated, such as SOCIETY [4], NET-scieNcETogether [5], LEAF [6], ERN APULIA [7], and BRIGHT-NIGHT [8]. Additionally also the SCIENCE4ALL project exists, founded only by Padua University [9]. The distribution of these projects across Italy regions is shown in Fig. 1. Each of these projects aims

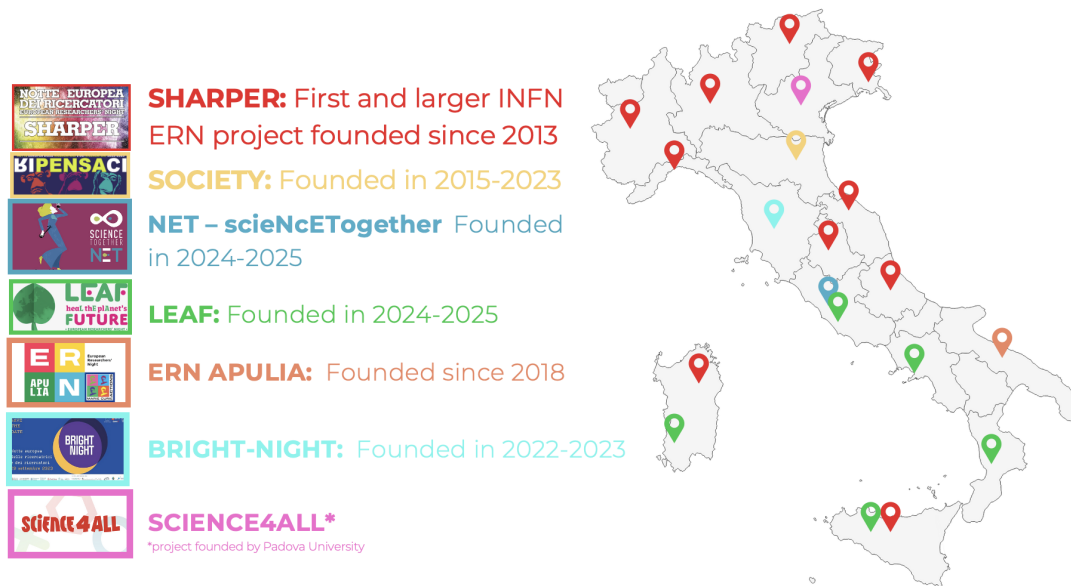


Figure 1: Overview of ERN projects in Italy since 2013

to boost the exchange between researchers and society, raise awareness of research and innovation activities, and highlight the real-world impact of scientific work on citizens' daily lives.

The INFERN activities are tailored to various groups, including families, pupils, and students, as shown in Fig. 2.



The aim is to increase scientific literacy, broaden access to science and research, and actively involve the public through immersive and hands-on experiences. Additionally INFN researchers strive to reduce the distance between science and society, discourage the spread of pseudoscience, and foster critical thinking across all age groups.

The success in engaging the public is largely due to the strong partnerships we have built with local organizations, educational institutions, and other stakeholders. These collaborations, shown in detail in Fig. 3 are vital in ensuring that INFN outreach activities are accessible and impactful.

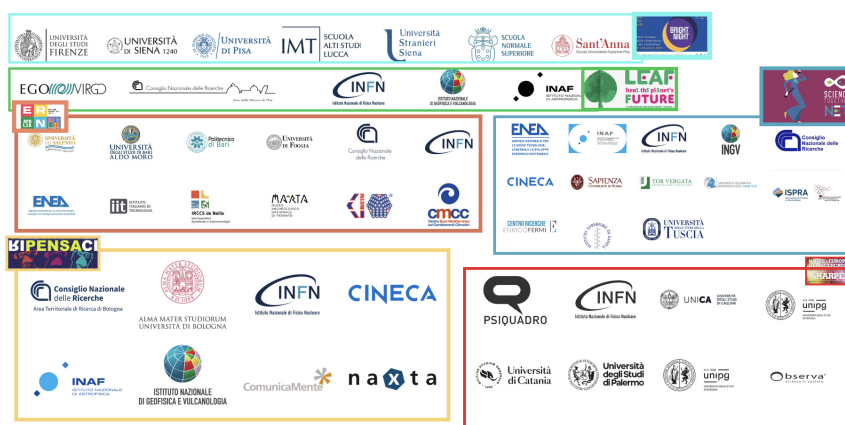


Figure 3: Overview of primary organizations, educational institutions, and other stakeholders who play the role of major partner within the INFN ERN projects

4. Researchers at School

One of the key initiatives within the ERN call is called 'Researchers at School' program, which runs throughout the school year. The activities included in this program not only bring science to life in classrooms but also involve students directly in the research process, fostering a deeper interest in scientific inquiry. Activities like Sumo Science [10], Improbable Research [11], and interactive seminars allow students to experience science in a fun and engaging way. Some pictures taken during these activities are shown in Fig. 4.



Figure 4: Some pictures from activities related to 'Researchers at School' program within ERN INFN projects

5. Waiting for the Night

In the lead-up to the European Researchers' Night, INFN Researchers organize a series of events to build anticipation. These include courses for teachers, scientific trekking, and guided tours of INFN laboratories and science museums, as shown in Fig. 5. These pre-event activities are



Figure 5: Some pictures from activities related to events organized while waiting for the ERN, the weeks before.

crucial for maximizing participation and excitement among the public.

6. ERN activities: online and in person

On the night itself, hands-on laboratories (shown in Fig. 6) are a major attraction. INFN researchers focus on a range of topics from particle physics to artificial intelligence, and the activities are designed to be highly interactive and age-appropriate. These labs allow the public to see the cutting-edge research being conducted and understand its relevance to the world around them.



Figure 6: Hands-on laboratories organized during the ERN.

One of the more unique offerings is the escape room experience. In 2021, INFN introduced HEPscape!, The High Energy Physics escape room [12] which runs in multiple cities and attracts about 500 visitors per year. This was followed by additional escape rooms (all shown in Fig. 7) in Padua, each themed around different scientific concepts, making learning fun and immersive for all ages.



Figure 7: Pictures taken during the running of the INFN escape rooms organized during the ERN.

INFN groups also offer a variety of shows during the European Researchers' Night, including virtual visits to CERN experiments, science movies, and theatrical performances that blend science

with entertainment. These shows (an example is shown in Fig 8) are a great way to engage a broad audience and make complex scientific concepts accessible.



Figure 8: An example of an INFN show presented also at the ERNs in Italy: La forza nascosta [13]

Finally online marathon [14] is another innovative approach to engaging the public, with 24 hours of continuous events, games, and discussions involving researchers from across Italy and Europe. This platform allows to reach a wider audience and keep the momentum of the night going well beyond the physical events.

7. Conclusions

By bridging the gap between the scientific community and the public, through the ERN activities INFN researchers inspire future generations and contribute to a more scientifically literate society. The efforts in the European Researchers' Night are crucial in demystifying science and making it more inclusive and engaging. In conclusion, the European Researchers' Night is more than just an event; it's a movement towards a more informed, science-savvy society. By continuing to support and expand outreach activities, INFN can nurture a vibrant, innovative future.

References

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