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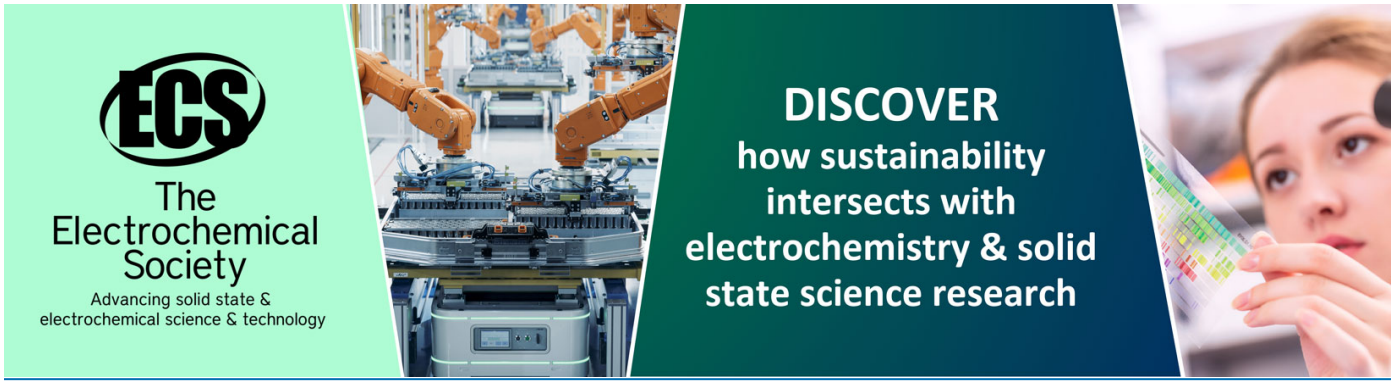

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Per un pugno di libri ... scientifici : a divulgation project for high-school students

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Abstract. We discuss the project "Per un pugno di libri ... scientifici", aimed at bringing the young generations closer to scientific culture through reading divulgation books about physics. The project, which is addressed to high-school students, is sponsored by INFN and other national and regional research institutions, along with physics departments of some Italian universities.

1. Introduction

This project was proposed for the first time in November 2020 during the European Researchers' Night, which was organized within SHARPER (SHAring Researchers' Passion for Enhanced Roadmaps), an initiative funded by the European Committee. The main goal of SHARPER is to promote the role of researchers in the society, and presently it involves several italian cities which host a University, i.e. Ancona, Cagliari, Camerino, Catania, Genova, L'Aquila, Macerata, Nuoro, Palermo, Pavia, Perugia-Terni, Sassari, and Trieste.

The idea, on which "Per un pugno di libri ... scientifici" (logo shown in Fig.1) is based, was inspired by the well-known italian RAI3 TV broadcast "Per un pugno di libri", and it was adapted to books of scientific divulgation regarding physics, mostly oriented to high-school students of fourth and fifth year. The following competition scheme was chosen : a committee chooses and proposes to students a scientific divulgation book, on which several questions

[2] Speaker

and games are devised. The students, grouped into two teams, one for each school, engage a competition following rules similar to the ones of RAI3 show, with the team reaching the highest score being declared winner and rewarded with a collection of books.

The first goal of our initiative is to push students to read popular books of scientific divulgation; this is not trivial since nowadays young students prefer more technological communication means instead of books. Moreover, because of the project structure, young students are forced to get organized all together, and coordinate their work in order to engage a competition. The essential contribution of their teachers consists in selecting the students among the best ones, assign roles (e.g. the spokesperson) within the team, and encourage them to read up on sources of knowledge, which can be very different from ordinary textbooks. This turns out to be very important, because the competition games rely on an extended general scientific culture.

In the following Section, we give further details of the project.

2. The project

The first edition of "Per un pugno di libri ... scientifici" was held during the 2020 European Researchers' Night in Catania, completely online due to pandemic. Two students' teams of local high schools, i.e. the Liceo Classico "M. Cutelli" and Liceo Scientifico "G. Galilei", attended the competition, which was organized as collaboration among INFN, University of Catania and CSFNSM-Centro Siciliano di Fisica Nucleare e Struttura della Materia, and held in Città della Scienza. The book chosen by the jury was "La Fisica dei Supereroi", by James Kakalios, published by Einaudi [1]. J. Kakalios is Taylor Distinguished Professor in the School of Physics and Astronomy at the University of Minnesota, and his research projects regard experimental solid state physics. Since 2001, he has been teaching a Freshman Seminar course entitled "Everything I Know About Science I Learned from Reading Comic Books", a hugely popular university course that generated media attention for its unique method of explaining complex physics concepts through comics. With "La Fisica dei Supereroi", see Fig.2, considered one of the best science books of 2005 by Discover, he introduced his original approach to a wide audience.

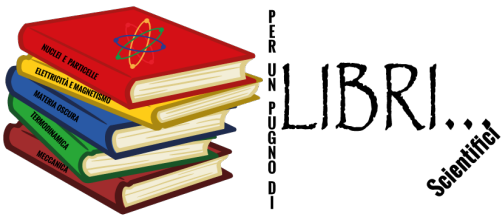

Figure 1. Logo of the project "Per un pugno di libri ... scientifici".

Figure 2. Book cover of "La Fisica dei Supereroi".

Given the big success of the first edition, as proved by the large number of visualizations on INFN Facebook and Youtube channels, the Catania group decided to extend the project to other Italian regions, thus involving more than 200 high schools students from Campania, Sardegna and Toscana, besides Sicilia. Regional competitions were organized mainly online, using the Streamyard platform, except the one in Toscana which was held in presence in Florence. The

Figure 3. Covers of the books chosen for the regional competitions.

four winners of the regional competitions then competed in two semifinals and a final. More in detail, the book chosen by the INFN-Catania jury for the sicilian schools was "Il Sogno di Democrito" [2] by Giorgio Chinnici; at INFN-Cagliari the local jury chose "Cosa accadrebbe se ?" [3] by Randall Munroe; "L'Enigma dei Raggi cosmici" [4] by Alessandro De Angelis was the book chosen by the jury at INFN-Napoli. Finally, the INFN-Firenze jury decided for "La Fisica in Casa" [5] by Emiliano Ricci. Except in Cagliari, the books' authors were present in all competitions, taking actively part with questions to and from the students, short interviews and games based on scientific culture about physics. The books covers are displayed in Fig.3.

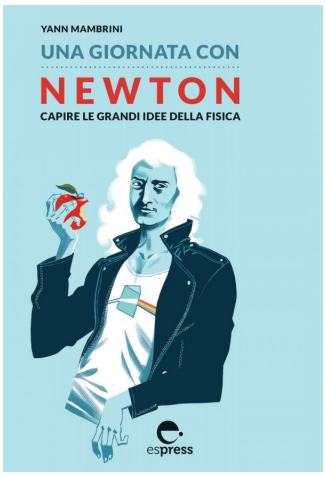

Figure 4. Cover of the book chosen for semifinals and final competition.

Figure 5. Group photo of students from "E. Boggio Lera" (white shirt) and "A. Nobel" (blu shirt) .

After the regional competitions, we turned to the semifinal and the final competitions. The book chosen for the semifinals and the final was "Una giornata con Newton. Capire le grandi idee della fisica" by Yann Mambrini, published by EsPress [6] (see Fig.4); the author was connected remotely to the audience. The final competition was disputed between Liceo "A. Nobel" from Torre del Greco (NA) and Liceo "E. Boggio Lera" from Catania. The winner, Liceo "A. Nobel", was awarded by the EsPress publisher with a big box full of books, similarly to the RAI3 show. Fig.5 displays all students after the final competition in Città della Scienza, Catania.

It is important to stress the large dimension of the audience remotely connected; in fact, after checking the Youtube channel of our initiative, https://youtu.be/XjJG9q-8AzM, we found about 3000 visualizations. The final event was largely represented in the national and local press. Articles' parts are displayed in Fig.6 and Fig.7, respectively from La Sicilia (Catania, issued on June 10th, 2022), and Il Mattino (Napoli, issued on June 10th, 2022).

VI LA SICILIA Venerdì 10 Giugno 2022

Catania

"Per un pugno di libri... scientifici"

Città della Scienza. Oggi finale nazionale dell'iniziativa dell'Istituto nazionale di Fisica nucleare in collaborazione con l'Università e il Centro siciliano di fisica nucleare e struttura della materia

Gli studenti del "Boggio Lera" sfideranno i ragazzi del liceo "Nobel" di Torre del Greco

Gli studenti del Boggio Lera

Figure 6. Article reprinted from "La Sicilia", Catania.

Torre del Greco

Nobel, campioni di fisica con la supertutor Sasso

Per un pugno di libri scientifici, il liceo vince il concorso a Catania Gli allievi seguiti dall'astrofisica torrese

Figure 7. Article reprinted from "Il Mattino", Napoli.

Students taking part in the "Per un Pugno di libri ... scientifici" obtain school credits and recognition of young apprenticeship programs for a total of 25 hours for the local competitions, which in Italy are presently called PCTO ("Percorsi per le Competenze Trasversali e l'Orientamento"), aiming to give students useful competences for employment purpose.

In the near future, we expect a significant increase of interest towards our project; for instance, the INFN-Cagliari colleagues have been asked to participate at the next edition of Festival Scienza in Cagliari. We are therefore ready to start the third edition of "Per un Pugno di libri ... scientifici", which will last for the whole 2022-23 school year.

2.1. Acknowledgments

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