



International Particle  
Physics Outreach Group

# IPPOG Resources Portal GUIDELINES

Version 3 (31/07/25)

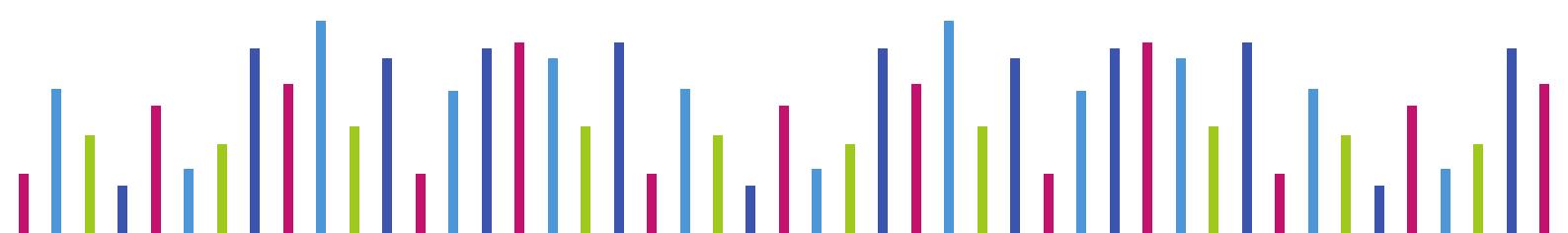
Hector PILLOT<sup>1</sup>

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For any question, please contact  
[Claire.Adam.Bourdarios@cern.ch](mailto:Claire.Adam.Bourdarios@cern.ch)

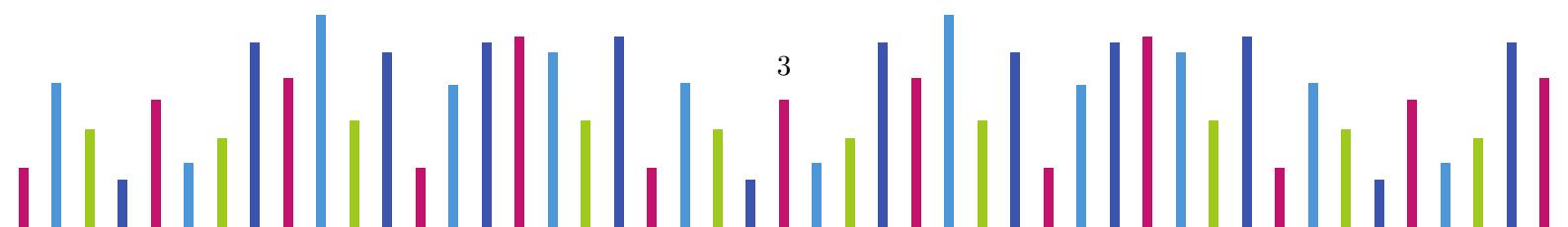
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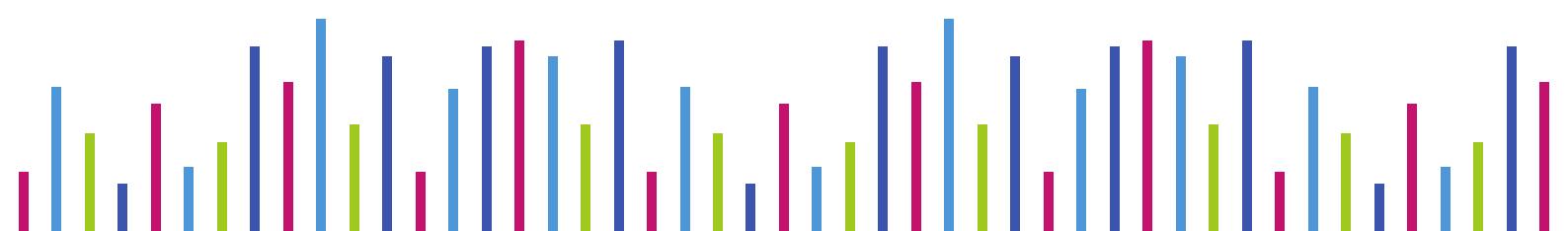
<sup>1</sup>Realized as part of the admin student contract of Hecotr Pillot (01/03/25 - 31/07/25)



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# Introduction

The “Resource portal” was created in 2025, at the request of the HEP community during the ICHEP 2024 conference<sup>2</sup>. It aims both to give an idea of outreach projects for the scientific community and to give a fair impression of the engagement and effort of the HEP outreach community.

The strategy for this resource portal is to serve as an online project database in which each outreach project is described in a post. We decided to start by uploading the projects presented by their owners and developers during IPPOG meetings’ “success stories” sections. The idea here is to direct to a presentation by the authors themselves, possibly supplemented by a few resources<sup>3</sup>. We then enlarged it to include outreach parallel sessions of international conferences such as:

- ICHEP – International Conference on High Energy Physics<sup>4</sup>
- ICRC – International Cosmic Ray Conference<sup>5</sup>
- HEP-EPS – European Physical Society Conference on High Energy Physics<sup>6</sup>
- LHCP – Large Hadron Collider Physics<sup>7</sup>

The website is built on the new CERN WordPress infrastructure<sup>8</sup>, which should replace the CERN Drupal websites from July 2025 onwards.

This document is divided into two parts. The first part (I) gives a general explanation of the website and its current status (Chapter 1). The second part (II) is a technical description of the website and of the upload process. Its first chapter gives an overview of the website’s structure (Chapter 2), the second describes the whole automated process (Chapter 3) from the database to uploading the projects on the website, and finally, the third chapter offers a visualization of the data uploaded on the website (Chapter 4). The last chapter reviews useful links related to the website (Chapter 5).

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<sup>2</sup>Education and Outreach Session @ICHEP 2024: <https://indico.cern.ch/event/1291157/contributions/5958376/>

<sup>3</sup>Presentation by Claire Adam @ICRC25: <https://indico.cern.ch/event/1258933/contributions/6475917>

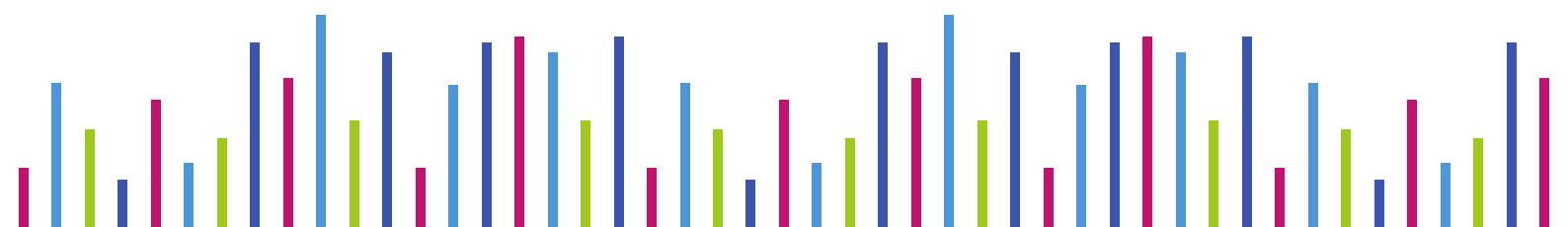
<sup>4</sup>ICHEP: <https://pos.sissa.it/cgi-bin/reader/family.cgi?code=ichep>

<sup>5</sup>ICRC: <https://pos.sissa.it/cgi-bin/reader/family.cgi?code=icrc>

<sup>6</sup>HEP-EPS: <https://pos.sissa.it/cgi-bin/reader/family.cgi?code=hep>

<sup>7</sup>LHCP: <https://pos.sissa.it/cgi-bin/reader/family.cgi?code=lhcp>

<sup>8</sup>CERN WordPress infrastructure: <https://wordpress.docs.cern.ch/>



# Part I

## General Description



# Chapter 1

## Context

As of 2025, CERN made the decision to migrate its website from Drupal to WordPress<sup>1</sup>. A key point about this software is the different types of content that can be created. It comes in two types: pages and posts (Section 1.1). During the website development phase, significant attention was given to the structure of posts, ensuring easy access through a clear taxonomy (Section 1.2) and enhancing readability by pinpointing important content to emphasize (Section 1.3).

### 1.1 WordPress types of content

WordPress enables the creation of two types of content: Pages and Posts<sup>2</sup>. Both display content on a website but are used for different purposes.

#### Pages

Pages are permanent fixtures of the site for people to access at any time. On this website, pages are typically used for the Homepage or the description of the taxonomy.

#### Posts

Posts are individual pieces of content. They are associated with properties like date, categories, tags, keywords, or even a picture and an excerpt. On this website, posts are used for presenting outreach projects. Thanks to the post properties, each project can be efficiently categorized according to the taxonomy and sorted depending on the need.

---

<sup>1</sup><https://wordpress.docs.cern.ch/>

<sup>2</sup><https://wordpress.com/support/post-vs-page/>

## 1.2 Taxonomy of the projects

The website aims to function as an online repository for outreach projects, serving as a resource hub. Therefore, it's essential to arrange these projects, and considerable work has gone into defining a taxonomy for classifying the projects. The RDB tags list<sup>3</sup> was used as a reference, but instead of focusing on resources like the previous website, this portal focuses on projects. And, as the objective of the portal changed, the taxonomy had to change as well. To define the current taxonomy, a first draft was proposed, based on various resource portals like CERN's<sup>4</sup> or the Perimeter Institute<sup>5</sup>.

In the meantime, approximately 120 outreach projects were identified from presentations made during "success stories" sessions of IPPOG meetings. In these sessions, conveners share their own outreach projects in particle physics and discuss the challenges and opportunities they faced. The taxonomy was evaluated against these projects to find out if it was adjusted appropriately and to check for any categories that were either vacant or excessively filled. The classification system was further refined, with new projects being added afterward. The final taxonomy finally stabilized with 25 categories (Table 1.1) grouped into 4 meta-categories:

### Topic

The topic refers to the main subject that the project focuses on.

*It can be, for example: Physics, Art, Sociology...*

### Type

The project type refers to the format that the project takes.

*It can be, for example: Book, Movie, Show...*

### Audience

The audience refers to the intended public, the specific group to which the project is adapted.

*It can be, for example: Adults, Children, Scientists...*

### Language

The language is a bit different from the other categories. It corresponds to the language in which projects were developed and aims to group together same-language projects in an effort to form discussion groups to help build language-specific pages and/or to collect material.

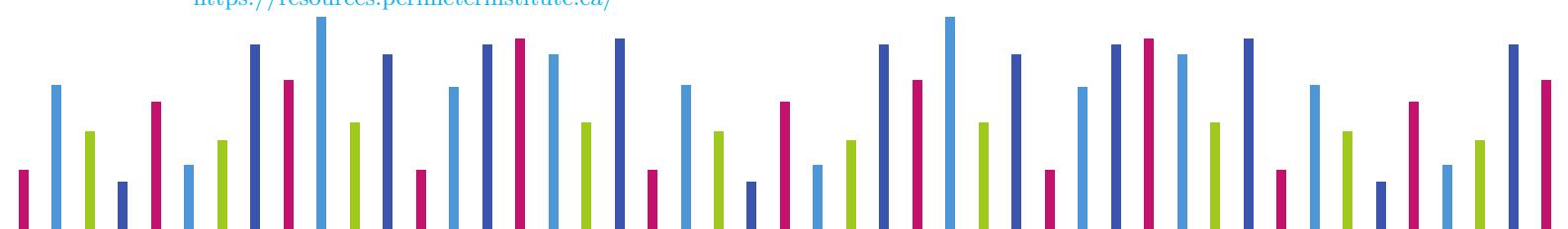
Topic (5)	Type (8)	Audience (6)	Language (6)
Universe	Labs & Visit Centers	Primary School (4-12 yo)	English
Matter & Forces	Online Resources	Educators & Outreach Community	French
Technology	Festivals & Temporary Events	Secondary School (12-19 yo)	German
Science & Society	Open Science Projects	Broad Public	Italian
Art Science	National Outreach Programs	University Level (19+ yo)	Portuguese
	Books & Publications	Scientific Community	Spanish
	Hands on Activities		
	Games		

Table 1.1: Categories

<sup>3</sup><https://ippog.org/ippog-resource-database>

<sup>4</sup><https://home.cern/resources>

<sup>5</sup><https://resources.perimeterinstitute.ca/>



These categories allow for straightforward navigation across the resource website. However, they lack the specificity needed to locate a particular project. To address this problem, tags were developed using the same method as categories. They act as a subcategory, with each category being subdivided into several tags to enable a fine-tuned search (Fig. 1.4.1 & 1.4.2).

Note, however, that if every project has categories, they don't all have tags. The decision was taken to specifically mention tags only for projects that focus on a specific field. For example, a very general project about "Matter & Force", referring to "Higgs", "Neutrinos", "Antimater" and "Nuclear physics" will only have the "Matter & Force" category and no tags, but a project about "Matter & Force" specifically about "Higgs" will have both the "Matter & Force" category and "Higgs" tag.

The current state of the website, including the number of projects from each category and tag, is available in Section 1.4.

### 1.3 Content choice

The aim of the resource portal is to provide access to the projects for all interested parties, regardless of whether they come from a scientific background or not. As such, posts had to be explicit while not being too dense. To achieve this, key information was identified as being:

- The name of the project and a general description
- Information about its authors and a way to contact them
- Status of the project
- Additional information

They were further developed as the following:

#### **Introduction**

This section provides a summary of the project, including its name in English (and in its original language, if available), along with an image that represents it. A brief abstract is included that outlines the project's main idea without going into details. For additional information about the project, a link to the presentation given at the conference is included.

#### **Information about its authors**

This section lists all authors involved in the project as well as their affiliations. There are also the affiliated IPPOG members<sup>6</sup> or associated members<sup>7</sup> and a contact, either an email or a URL leading to a contact form.

#### **Status of the project**

This section gives the status of the project. It can either be "Unknown", "In preparation", "Ongoing", "Available" or "Done". As the status is subject to change, the date of the most recent update of the post is included.

#### **Additional information**

This section compiles supplementary documents and links pertinent to the project. This generally includes websites, presentations from other conferences, or academic papers.

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<sup>6</sup>IPPOG members: <https://ippog.org/members>

<sup>7</sup>IPPOG associated members: <https://ippog.org/associated-members>

## 1.4 Current state of the Website

At the moment this document is written, 121 projects have been posted on the website. Statistics regarding the affiliated IPPOG (associated) members, topics, and types were produced.

### Affiliated IPPOG (associated) members

The representation of IPPOG members is noticeably unbalanced (Fig. 1.4.3), with Germany and Italy being the most represented countries, followed by France and the United States of America, which conduct extensive outreach activities through Netzwerk Teilchenwelt, INFN, IN2P3, and QuarkNet. Major collaborations such as ATLAS and ALICE, along with CERN, also make significant contributions due to their larger scale. But most members have close to no outreach projects listed on the website. Developing language discussion groups could help reduce this gap.

A difficulty here is that the choice was made that only content presented in a conference or meeting would be uploaded on the website. This choice enables the use of a short abstract, complemented by the slides from the outreach session in which it was presented. This also guarantees the quality of the projects, as it was presented during big meetings. The problem, however, is that such outreach sessions are limited during conferences. Additionally, not all conferences offer their own outreach sessions, and some have only recently introduced them. This greatly reduces the available projects from some parts of the world.

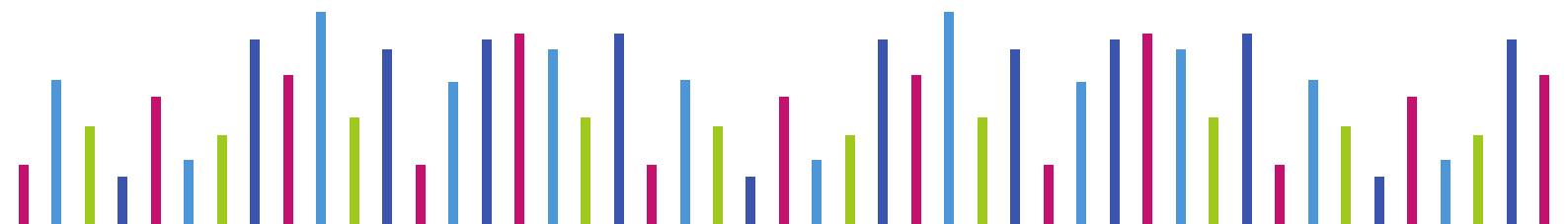
### Topics

Among the covered topics, "Matter & Force" is the most represented, with its subtopic "Standard model of elementary particles" (Fig. 1.4.4) which is no wonder, as it is the main focus of the outreach group. Three subtopics were left even though empty: "Machine learning", "Civil Engineering & Construction" and "Cryogeny, Magnet & Supraconductors", as they remain pertinent topics, but they could be removed if no related outreach projects are added.

### Types

There are many different types of outreach projects, and this meta-category aims to demonstrate their full diversity (Fig. 1.4.5). In this scenario, the "Festival" is the subtopic that appears most frequently. This is because outreach activities like demonstrations, visits, or even games tend to be used during temporary events like science fairs. As such, it is not the activity or visit that is presented during outreach sessions, but the festival in which it was used.

Another issue is that speakers often give an overview of what their laboratory, experiment, or country did, rather than focusing on individual projects. This results in the presentation turning into a broad overview, lacking sufficient details to upload several projects onto the website. The solution found was to introduce the subtopics "Experiment" and "Laboratory" projects, as well as the topic "National outreach program" which has no subtopics.



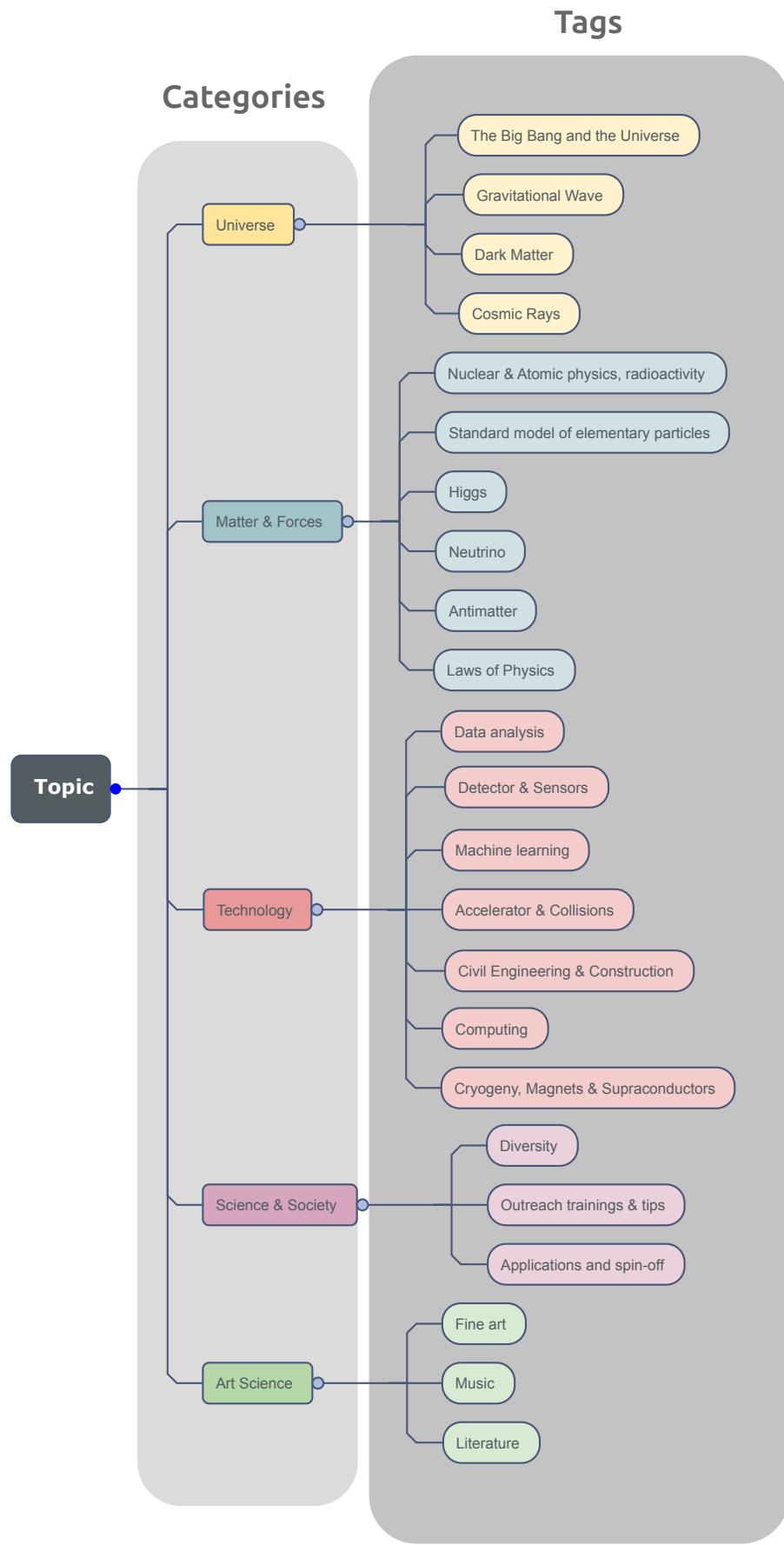


Figure 1.4.1: Taxonomy of Topics

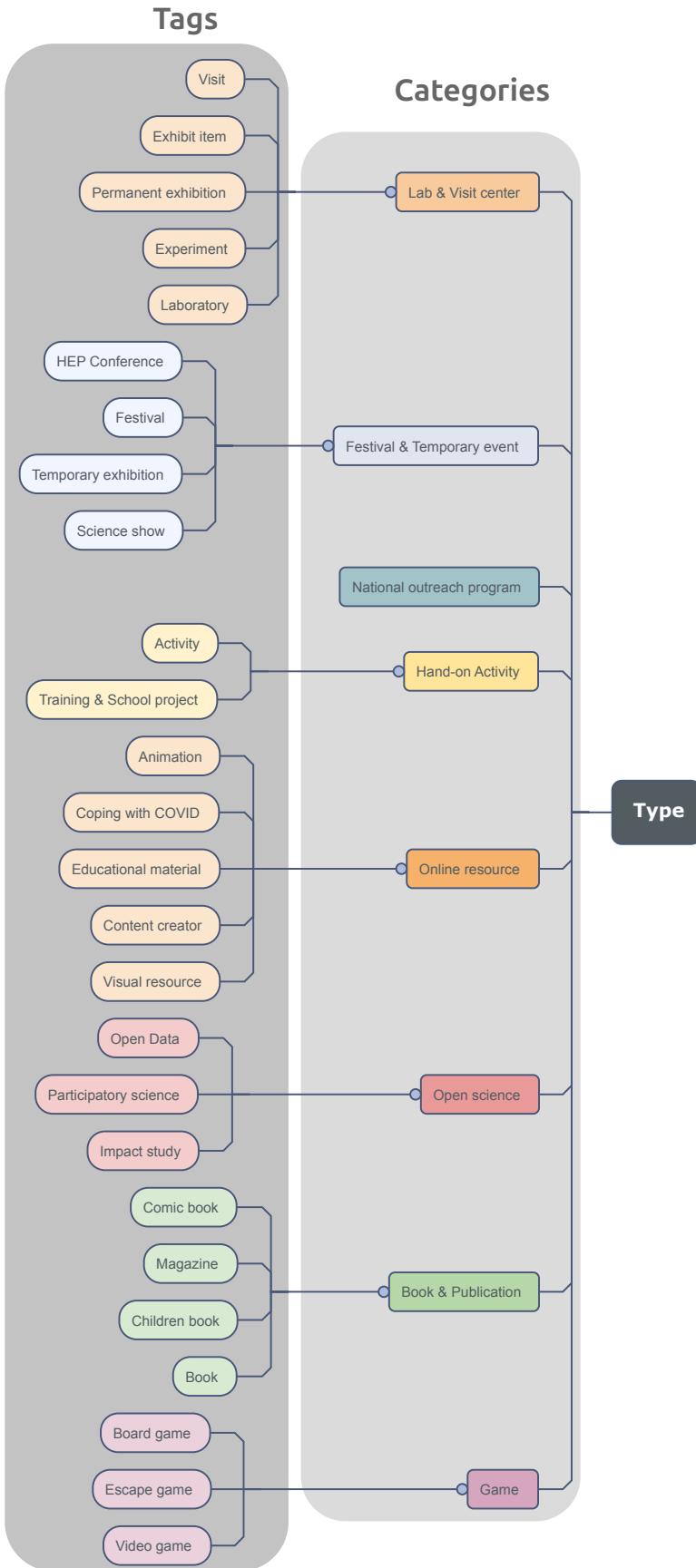
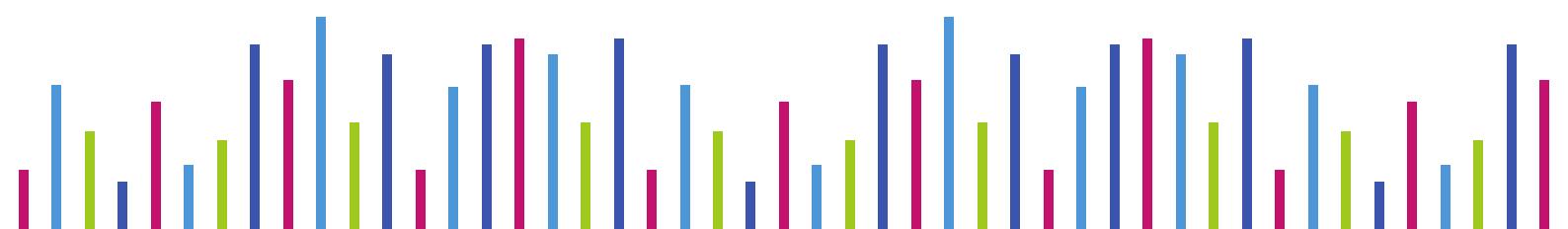


Figure 1.4.2: Taxonomy of Types



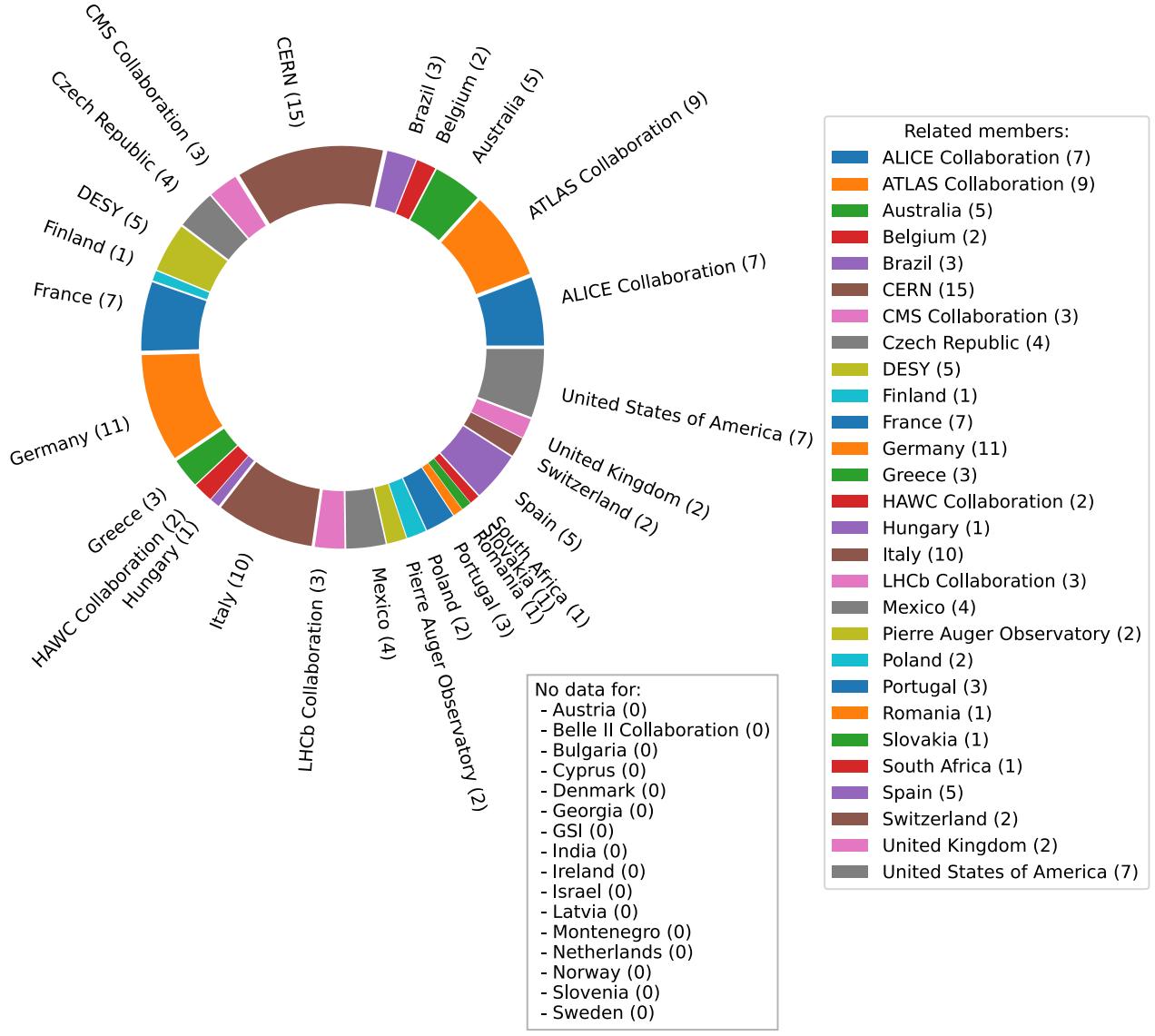


Figure 1.4.3: Related members data

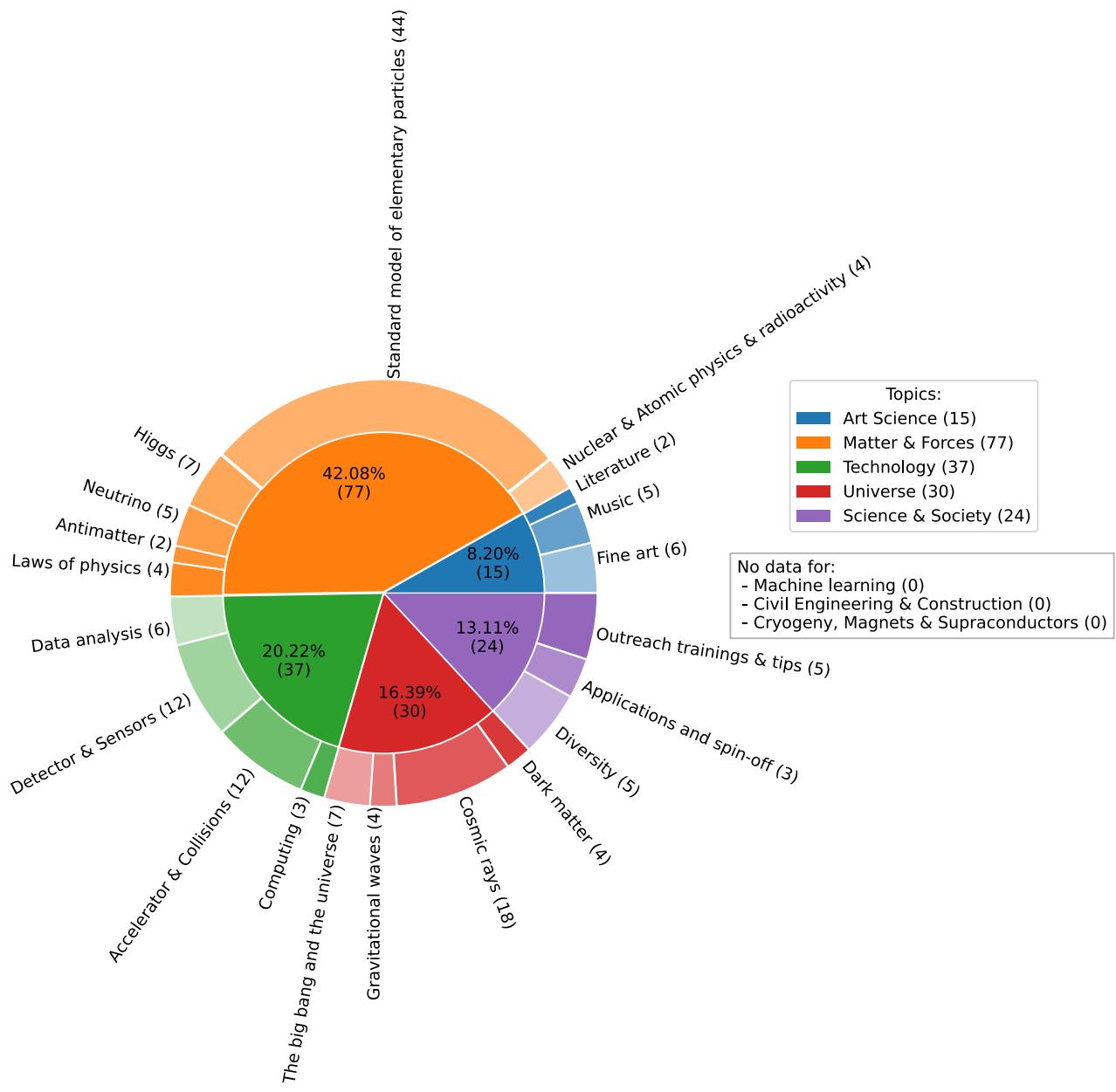


Figure 1.4.4: Topics data

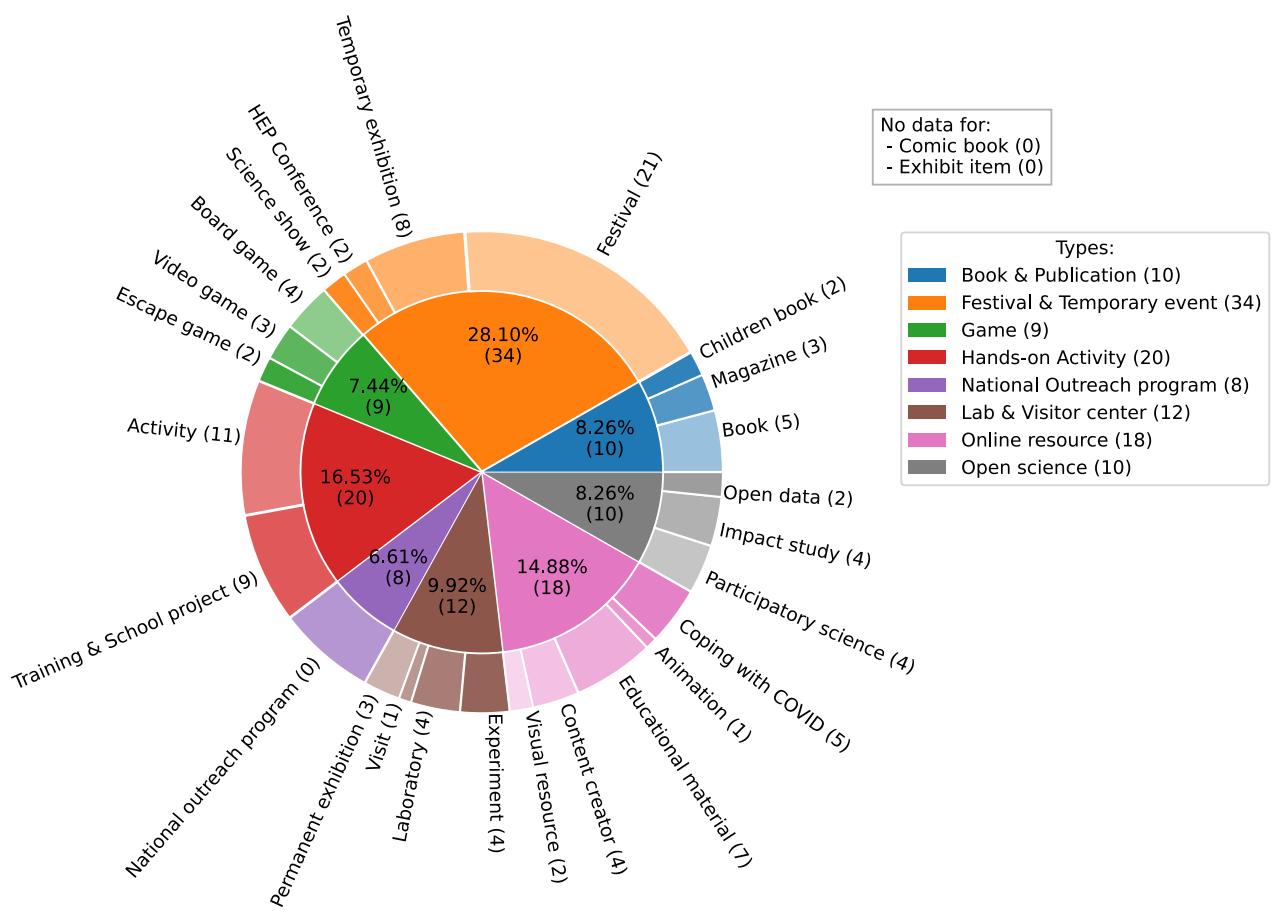


Figure 1.4.5: Types data



## Part II

# Technical Description



# Chapter 2

## Website's Structure

This section describes the different parts of the website, from the Home page (Sec. 2.1.1) and its Menu (Sec. 2.2) leading to the Meta-category (Sec. 2.3) and Category (Sec. 2.4) pages (with the special case of the Language category (Sec. 2.5). Then, the section describes the Posts (Sec. 2.6) and the pages generated automatically by their tags and categories (Sec. 2.7) and finishes by explaining the General Information menu (Sec. 2.8).

### 2.1 Home page

The home page<sup>1</sup> is the first page the user gets to. It aims to present the website and redirect to the main pages of the website. A screenshot is available in Figure 2.1.1.

#### a. Home banner

[Cover block] including the logo of the IPPOG Collaboration with a catchphrase "Explore the foundations of the universe!" over a picture of students participating in International Physics Masterclass.

#### b. Title

[H1 Title block]: "Presenting Particle Physics Outreach Projects".

#### c. Presentation

[Paragraph block] presenting the website.

#### d. Meta-Categories

[Paragraph block] introducing the categories, followed with [Buttons block] leading to the meta-categories pages nested within [Cover block] in a [Columns block].

#### e. Latest entries

[Title H2] Block followed by a [News block]<sup>2</sup> displaying the 3 latest posts, uploaded. Note that it is possible to force the displayed posts as their uploaded date can be updated.

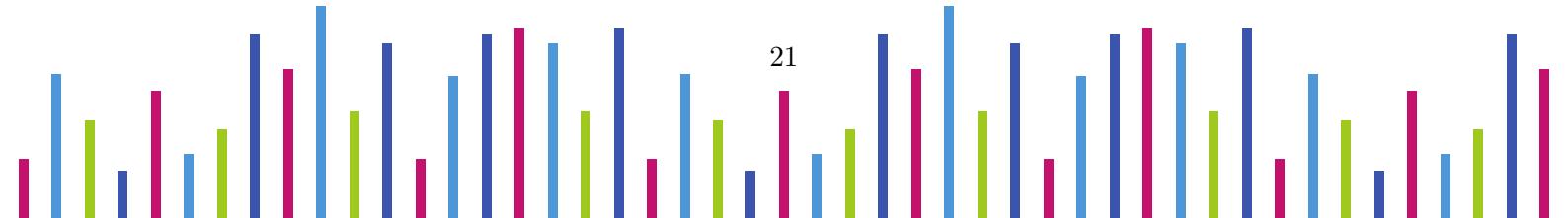
#### f. Footpage banner

[Cover block] following the IPPOG color chart.

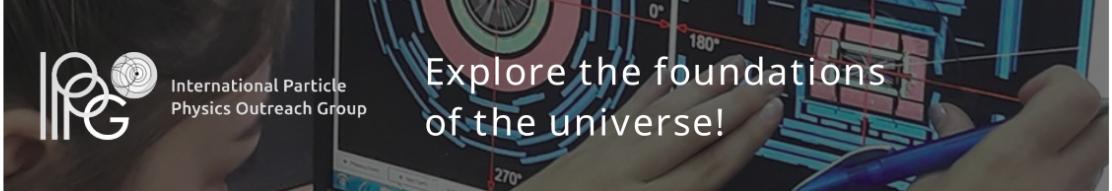
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<sup>1</sup>Home page: <https://ipogg-resources-portal.web.cern.ch/>

<sup>2</sup>The News block is a CERN customized Query Loop displaying posts and allowing the filtering per categories and/or tags. The choice was made to display the image, title, tags and excerpt of posts.



 Home Project Type ▾ Project Topic ▾ Project Audience ▾ Languages ▾



**a**

## Presenting Particle Physics Outreach Projects **b**

The International Particle Physics Outreach Group ([IPPOG](#)) is a global network of researchers, educators and communication specialists working together to develop and share best practices in science education and public engagement. Our school programmes, including [International Masterclasses](#) and [Global Cosmic](#), reach thousands of students, each year, instilling them with an appreciation for fundamental research and a deeper understanding of the scientific process, while our outreach activities foster public support for particle physics and related fields around the world.

The [IPPOG Collaboration](#) currently comprises 44 members: 32 countries, 7 experiments (ALICE, ATLAS, CMS and LHCb at CERN, Belle II at KEK, and the HAWC and Pierre Auger observatories) as well as CERN as an international laboratory. DESY and GSI are associate members. IPPOG also works in close partnership with a wide range of laboratories, institutes and science centers, as well as some members of [APPEC](#) (Astro Particle Physics European Consortium) and [NUPECC](#) (Nuclear Physics European Collaboration Committee).

Over the years, presentations of "Success Stories" were organised and resources were collected. Some of them are presented here to inspire the colleagues and science fans willing to get an overview of the "state of the art" in our field and, maybe, be inspired and encouraged to get started?

**c**

Find these "Success stories" categorized by Type of content, Scientific Topic, Targeted Audience and Language:

**d**

Type Topic Audience Language

**e**

### Latest entries



Urknall Unterwegs: a mobile LHC exhibition in Germany

Institute outreach efforts usually leave out people who don't have an inherent interest in the subject to start with. The proposed solution is a mobile outdoor exhibition that travels to locations frequented by the public, such as...

Explore → Explore



INTERNATIONAL COSMIC DAY  
November 26 | 2024

International Cosmic Day, An Astroparticle Physics Outreach Event for High-School...

Explore → Explore



Science & Art Science

Arts & science across Italy: from high-schools to CERN

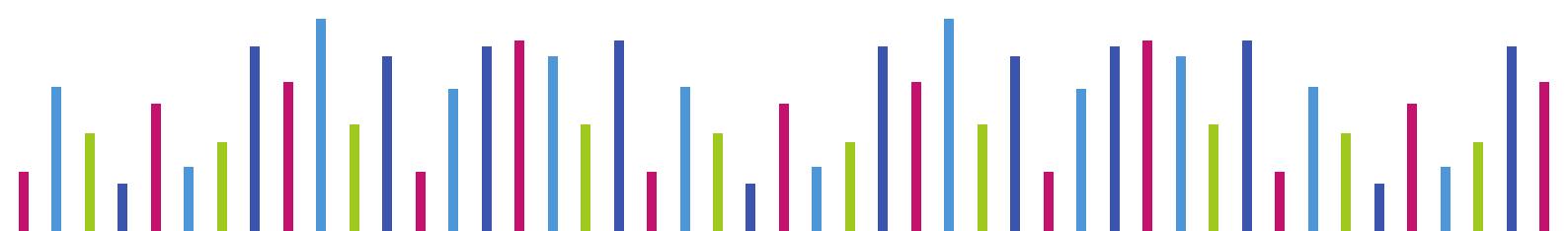
The main idea is to engage high school students with science using artistic languages, regardless of students' specific skills or level of knowledge. The project begins with an educational phase and is followed by an arts-based competition...

Explore →

**f**



Figure 2.1.1: Website Home page



## 2.2 Menus

Menus can be displayed in 2 locations:

- Header Navigation: at the top of the website
- Footer Navigation: at the bottom of the website, the footer is separated into 3 columns

The website is using 3 menus (Fig. 2.2.1):

### a. CERN & You

This is the classic CERN menu displayed in all CERN websites. It is not displayed at the moment because it is not relevant for the collaboration. /!\\ It may automatically come back when the WordPress structure is updated.

### b. General Information

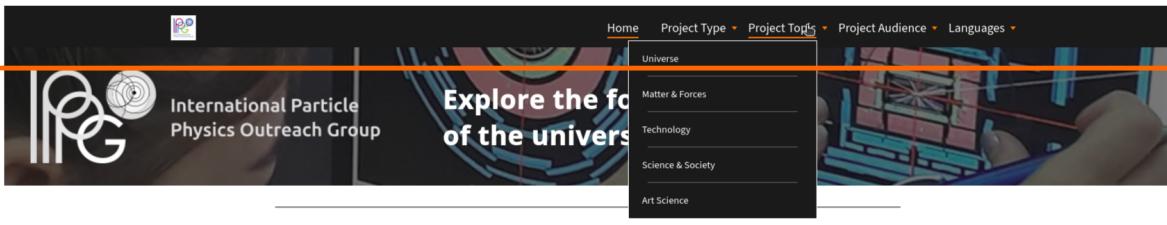
This menu gives further information about IPPOG and the website.

- A first link "Custom Link Brought to you by the IPPOG collaboration, on behalf of the Particle Physics outreach community." leads to the FAQ (Section 2.8.1),
- The second link "Further details on the categorization." leads to the explanation of the tags (Section 2.8.2).

### c. Main Navigation

The main navigation menu includes links to:

- the Home page (Sec. 2.1)
- the different pages related to meta-categories: Project Type / Project Topic / ... (Sec. 2.3). By passing the mouse over the categories name, the user can make a scroll-down menu, detailing the different category's pages: Universe / Matter & Forces / ... (Sec. 2.4).



**C**

## Presenting Particle Physics Outreach Projects

The International Particle Physics Outreach Group ([IPPOG](#)) is a global network of researchers, educators and communication specialists working together to develop and share best practices in science education and public engagement. Our school programmes, including [International Masterclasses](#) and [Global Cosmics](#), reach thousands of students, each year, instilling them with an appreciation for fundamental research and a deeper understanding of the scientific process, while our outreach activities foster public support for particle physics and related fields around the world.

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Over the years, presentations of "Success Stories" were organised and resources were collected. Some of them are presented here to inspire the colleagues and science fans willing to get an overview of the "state of the art" in our field and, maybe, be inspired and encouraged to get started?

Find these "Success stories" categorized by Type of content, Scientific Topic, Targeted Audience and Language :

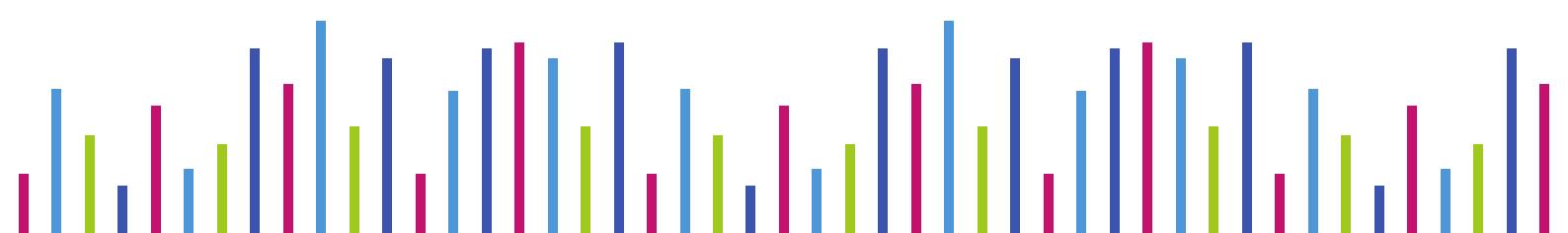
**Type**    **Topic**    **Audience**    **Language**

### Latest entries

Image	Title	Description	Actions
	Urknall Unterwegs: a mobile LHC exhibition in Germany	Institute outreach efforts usually leave out people who don't have an inherent interest in the subject to start with. The proposed solution is a mobile outdoor exhibition that travels to locations frequented by the public, such as marketplaces, parks, and public...	→ Explore
	International Cosmic Day, An Astroparticle Physics Outreach Event for High-School...	International Cosmic Day is an annual event bringing together young people, teachers, and scientists around astroparticle physics. This day is dedicated to cosmic rays through discussions, creative competitions, experiments, and much more.	→ Explore
	Arts & science across Italy: from high-schools to CERN	The main idea is to engage high school students with science using artistic languages, regardless of students' specific skills or level of knowledge. The project begins with an educational phase and is followed by an arts-based competition between...	→ Explore

**a**      **b**

**Figure 2.2.1: Website menus**



## 2.3 Meta-Categories pages

The Meta-Categories pages (Fig. 2.3.1) display all categories related to the meta-category and the last three projects uploaded for each category.

### a. IPPOG color chart

[Cover block] including one of the colors of the IPPOG's color chart.

### b. Title

[H1 Title block]: Either "Project Type" / "Project Topic" / "Project Audience".

### c. List of categories

[Buttons block] leading to the categories pages nested within [Cover block] in a [Columns block].

### d. Latest updated projects for each category

[Group block] For each category<sup>3</sup>. The block contains:

- a [Cover block] including one of the colors of the IPPOG's color chart,
- a [H2 Title block] "Latest projects for" followed by the name of the category,
- a [Paragraph block] introducing the category,
- a [News block] displaying the 3 latest posts uploaded in the relative category.

---

<sup>3</sup>Except for the "Language" meta-category that doesn't have this part.

**a**

**b**

**c**

**d**

**Projects Types**

Labs & Visit Centers

Festivals & Temporary Events

National Outreach Programs

Hands on Activities

Online Resources

Open Science Projects

Books & Publications

Games

Latest projects for Labs & Visit Centers

Exhibitions and activities are proposed by Laboratories & Visit centers open to the general public or to specific groups and communities.

**VR Initiatives across the LHC experiments**

Visit

Virtual reality generates a virtual 3D environment, recreating the detector and its caverns with 3D models. It enables immersive and interactive visits, and is usable even during data taking and remotely.

Explore

**CERN Science Gateway**

Permanent Exhibition | Science Show

The CERN Science Gateway is an education and outreach center consisting of immersive multimedia exhibits, hands-on lab workshops, science shows, events that blend science and culture, and tours around the facility.

Explore

**IceCube Education & Outreach Activities**

Cosmic rays | Experiment | Neutrino

IceCube engages a local, national, and international audience through public outreach events like science festivals and educational game sessions, but also through educational programs during masterclasses and after school programs. They have also develop...

Explore

Latest projects for Festivals & Temporary Events

Festival & Temporary event are rich projects that take place from a few hours to a few month. They usually combine multiples types of outreach projets like talks, demonstrations, art-science...

**INTERNATIONAL COSMIC DAY**

Figure 2.3.1: Meta-categories pages (example of the "Projects Types" page)

## 2.4 Categories pages

The Categories pages (Fig. 2.4.1) display all projects related to the category. The "Language" categories are a bit different and will be developed in more detail in Sec. 2.5.

### a. Category's banner

[Cover block] including a [H1 Title block] with the name of the Category over a picture illustrating it.

### b. Introduction

[Paragraph block] introducing the category.

### c. Tags

[Paragraph block] introducing the tags followed by [Buttons block] leading to the automatically produced tags pages (Sec. 2.7)

### d. Projects

[News block] displaying all projects with the related category.

**a**

**b**

**c**

**d**

Figure 2.4.1: Categories pages (example of the "Matter & Forces" page)

## 2.5 Language Categories pages

The language categories (Fig. 2.5.1) are a bit different from other categories. As it aims to form discussion groups, these pages have a strong focus on the countries. Also, all these pages are translated into their own language.

### a. Title

[H1 Title block] with the name of the related language.

### b. Introduction

[Paragraph block] introducing the members of the collaboration related to the language.

### c. IPPOG members

[Paragraph block] followed by a [List block] listing the representatives of the member countries with a link leading to the IPPOG general website.

### d. Countries participating in Masterclass

[Paragraph block] followed by a [List block] listing the countries (members of IPPOG or not) participating in International Physics Masterclass.

### e. Projects

[News block] displaying all projects with the related language.

**a**

**b**

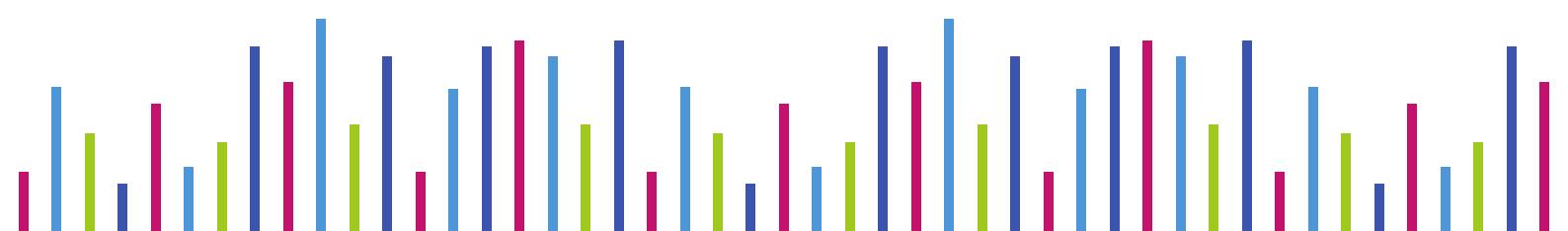
**c**

**d**

**e**

**e**

Figure 2.5.1: Language category pages (example of the "Spanish" page)



## 2.6 Project Posts

The Posts (Fig. 2.6.1) present all information relevant to one project. All data are extracted from the database.

### a. Title & Image

[Media & Text block] made of the [Featured Image block] of the post on the right, and the [H1 Title block] of the post on the left. There can also be a [H2 Title block] working as a subtitle below the title.

### b. Credit for the image

[Paragraph block] crediting the author of the featured image, aligned on the right.

### c. Abstract

[H2 Title block] "Abstract" followed by a [Paragraph block] briefly describing the project.

### d. Presentation slides

[List block] linking to the presentation of the project during a conference or a meeting.

### e. Authors

[H2 Title block] "Contact" followed by a [Paragraph block] "Authors: " and a [List block] listing the authors of the project and their affiliations.

### f. Related IPPOG members

[Paragraph block] "Related IPPOG Collaboration members:" followed by a [List block] listing the IPPOG members relevant for the project, and linking to the general IPPOG website.

### g. Public Contact

[Paragraph block] "Contact:" followed by a [List block] with either an email or a link to a contact form to contact the authors of the project.

### h. Status

[H2 Title block] "Project status" followed by a [Paragraph block] describing the status of the project and the last time the post was updated.

### i. Files & Resources

[H2 Title block] "Files & Resources" followed by a [List block] linking to relevant resources.

### j. Categories & Tags

[Categories block] and [Tags block] of the post linking to the automatically generated pages (Sec. 2.7).

IPPOG

Home Project Type ▾ Project Topic ▾ Project Audience ▾ Languages ▾

## “Become a particle physicist in eight simple moves” book



Credit : Stefano Martinuz

### Abstract

The book was born out of a simple but strong wish: to inspire people to consider pursuing a career in physics.

It aims to be an introduction to the world of particle physics while skillfully blending humor with profound insights.

- [IPPOG presentation \(2022\)](#)

### Contact

Authors :

- Writer : Simone Ragoni, (Creighton University (USA))
- Cover : Stefano Martinuz

Related IPPOG Collaboration member :

- [ALICE Collaboration](#)

Contact :

- simone.ragoni.94 [at] gmail.com

### Project status

Available (updated 2025-06-11)

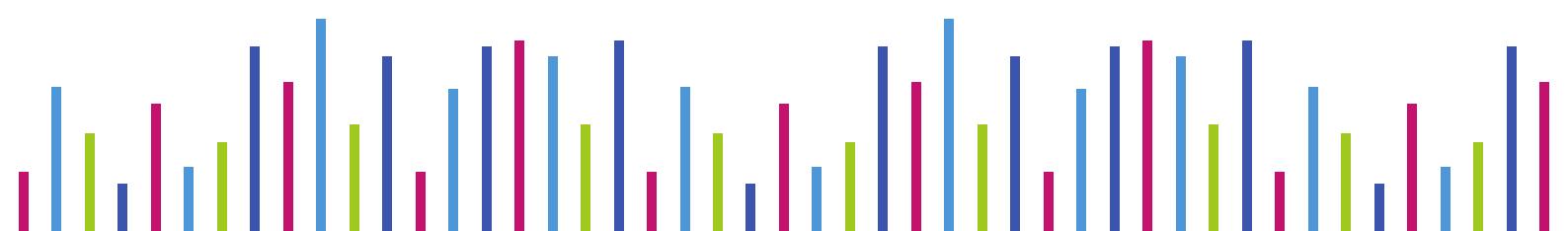
### Files & Resources

- [Website](#)
- [CERN Courier article \(EN\)](#)

Categories : Audience:Broad Public, Language:English, Language:Italian, Topic:Matter & Forces, Topic:Technology, Type:Book & Publication

Tags : Accelerator & Collisions, Book, Data Analysis, Detector & Sensors, Standard model of elementary particles

Figure 2.6.1: Post pages (example of the “Become a particle physicist in eight simple moves book” post)



## 2.7 Categories & Tags automatic pages

WordPress automatically generates pages for each category and tag (Fig. 2.7.2). These pages can be accessed either through:

- the links in [News Blocks] (Fig. 2.7.1c),
- at the top of category-specific pages (Fig. 2.7.1b), or
- at the end of posts (Fig. 2.7.1a).

As they are generated automatically, they cannot be modified at the moment and, as such, they remain not very visually attractive. This is why the choice was made to create easier-to-navigate pages (Sec. 2.4.1).

Categories : Audience:Broad Public, Language:English, Language:Italian, Topic:Matter & Forces, Topic:Technology,  
Type:Book & Publication

Tags : Accelerator & Collisions, Book, Data Analysis, Detector & Sensors, Standard model of elementary particles

(a) at the end of posts



(b) at the top of category-specific pages

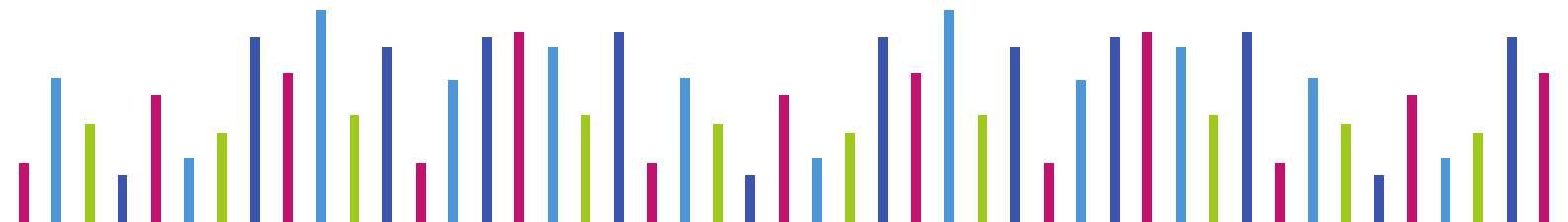


International Cosmic Day is an annual event bringing together young people, teachers, and scientists around astroparticle physics. This day is dedicated to cosmic rays through discussions, creative competitions, experiments, and much more.

Explore →

(c) in [News Blocks]

Figure 2.7.1: Links to Categories & Tags automatic pages



Home Project Type ▾ Project Topic ▾ Project Audience ▾ Languages ▾

## Tag: Standard model of elementary particles

**Urknall Unterwegs: a mobile LHC exhibition in Germany**

Institute outreach efforts usually leave out people who don't have an inherent interest in the subject to start with. The proposed solution is a mobile outdoor exhibition that travels to locations frequented by the public, such as marketplaces, parks, and public squares.

[View post](#)

**Arts & science across Italy: from high-schools to CERN**

The main idea is to engage high school students with science using artistic languages, regardless of students' specific skills or level of knowledge. The project begins with an educational phase and is followed by an arts-based competition between teams of students.

[View post](#)

**Physics Cakes**

Using cake to engage new audiences with particle physics both at in-person events and with online platforms such as social media and virtual science fairs. This innovative approach using the juxtaposition of cake and physics makes for a fun and memorable experience, and has been demonstrated to engage new and low science capital audiences and...

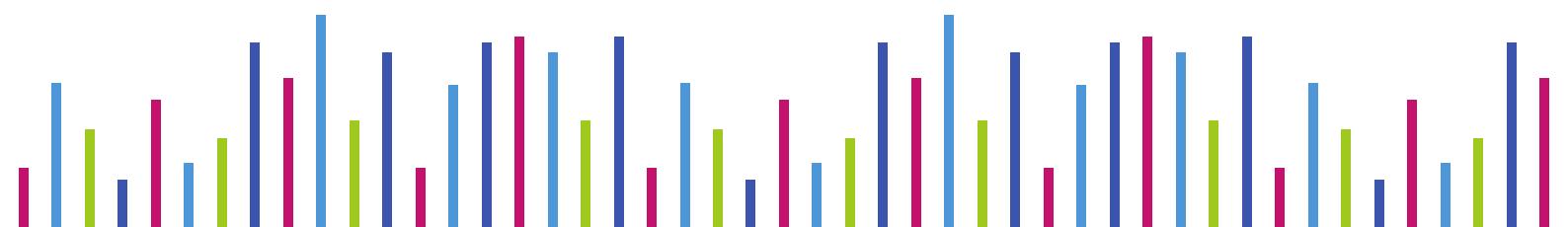
[View post](#)

**INFN Experience at the European Researchers' Night**

The European Researchers' Night is a festival that takes place for one night across Europe, featuring hands-on activities and science demonstrations organized by the INFN, as well as an escape game called HEPscape! They also host a series of events during the months before.

[View post](#)

Figure 2.7.2: Categories & Tags automatic pages



## 2.8 General Information

The General Information menu (Fig. 2.8.1) links to two pages: a general description of the IPPOG Collaboration (Sec. 2.8.1) and the Taxonomy used in the website (Sec. 2.8.2)

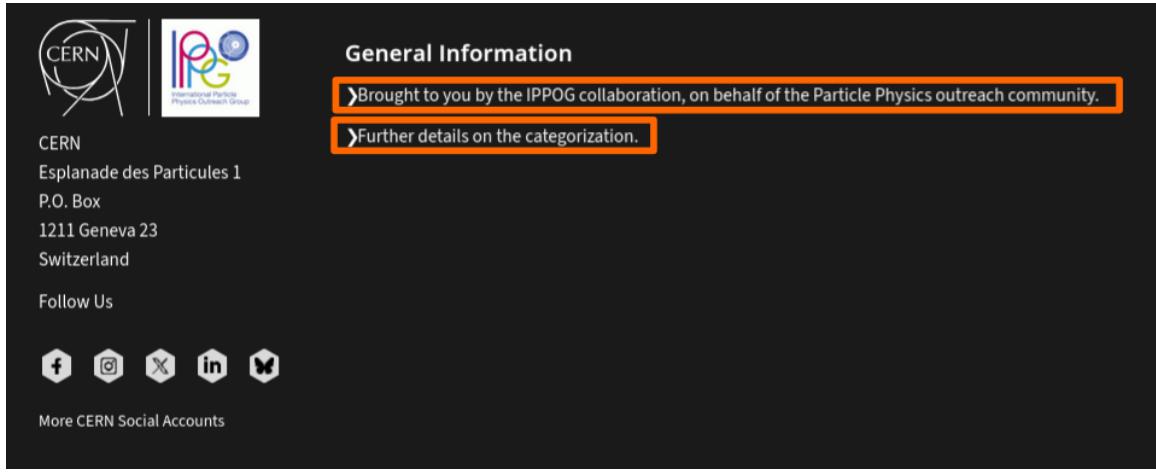


Figure 2.8.1: General Information menu

### 2.8.1 FAQ

The FAQ page (Fig. 2.8.2a) gives a general description of the collaboration.

#### a. Presentation of the IPPOG

This section presents the IPPOG collaboration, its goals, members, and a few relevant links.

#### b. Flagship activities of the IPPOG

This section lists the current activities of the IPPOG collaboration.

#### c. Presentation of the Resource Portal

This is a small presentation of the Resource Portal and why it was created.

#### d. Contact

Link to the contact form.

### 2.8.2 Categorization

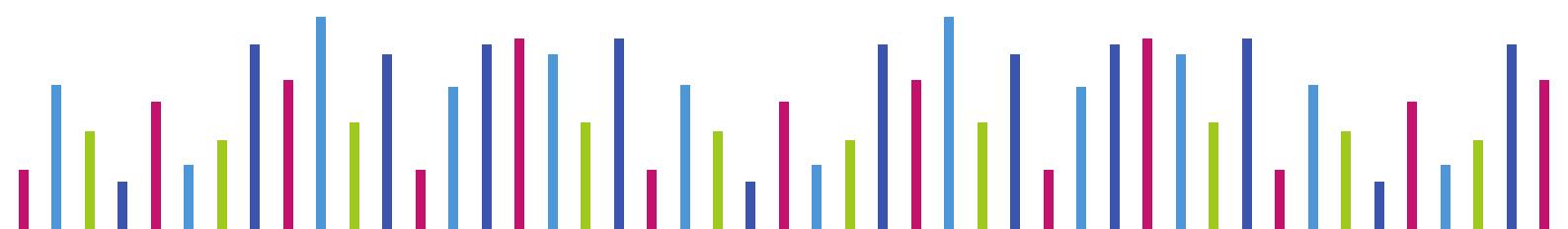
This page (Fig. 2.8.2b) gives a quick overview of the taxonomy used to classify the projects on the website.

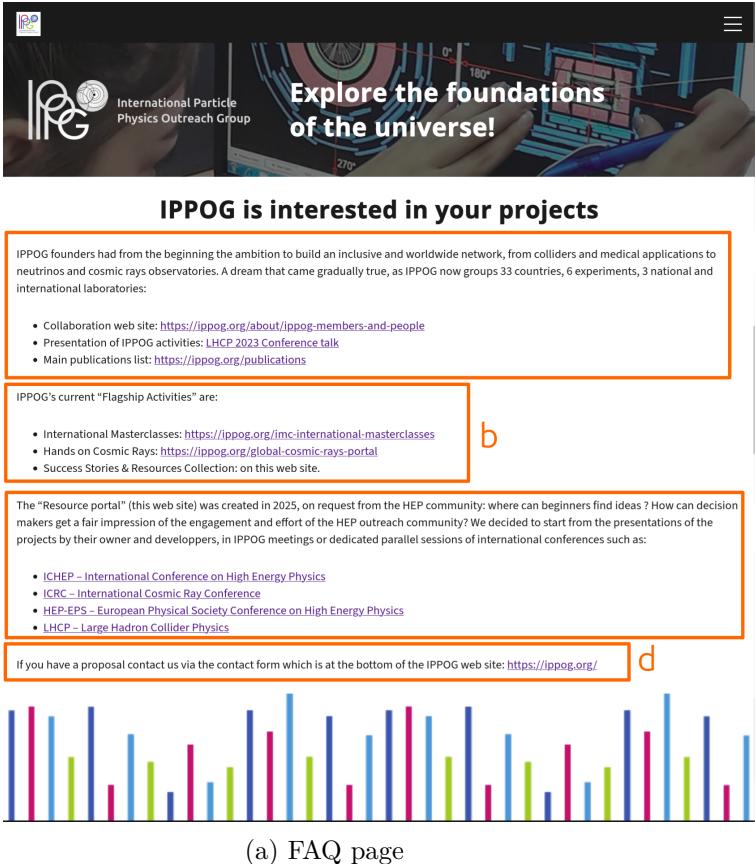
#### a. Introduction

This section gives a small introduction to the taxonomy.

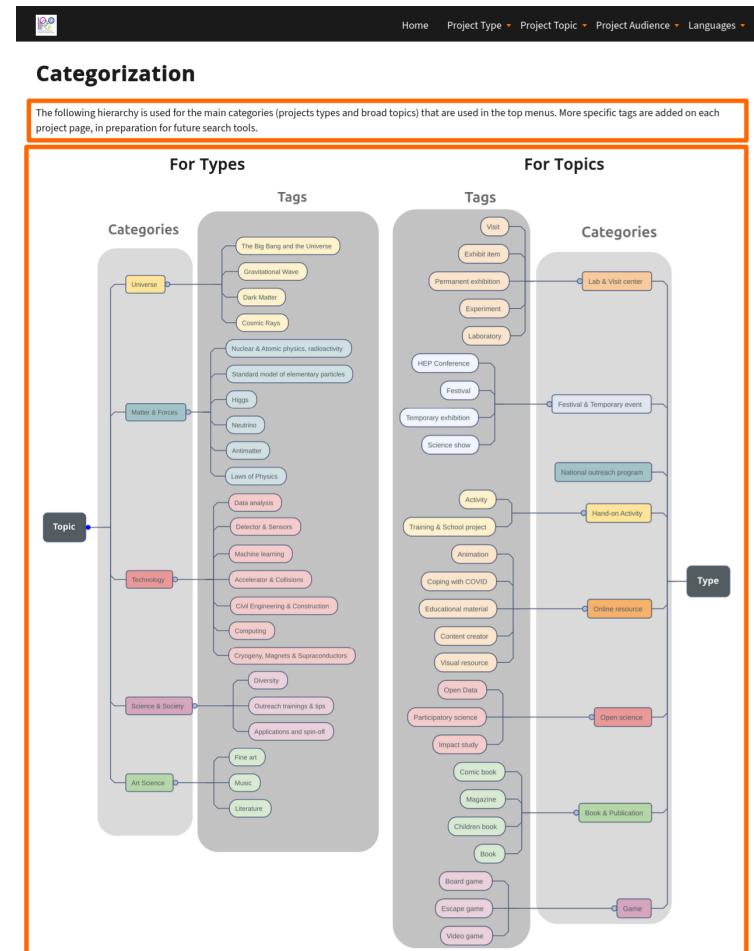
#### b. Taxonomy

This is the infographic available in Fig 1.4.1 & 1.4.2. These are created using the FraMindmap software (Sec. 4.1).





(a) FAQ page



(b) Taxonomy page

Figure 2.8.2: General Information menu

# Chapter 3

## Upload Process

This chapter explains the whole process of uploading posts on the website, from filling out the Google form (Section 3.1) linked to a database on Google Sheet (Section 3.2), to running the Python code (Section 3.3) that formats the data into text that can be copy-pasted onto the website (Section 3.4). A flowchart summarizing the process is available below (Fig 3.0.1).

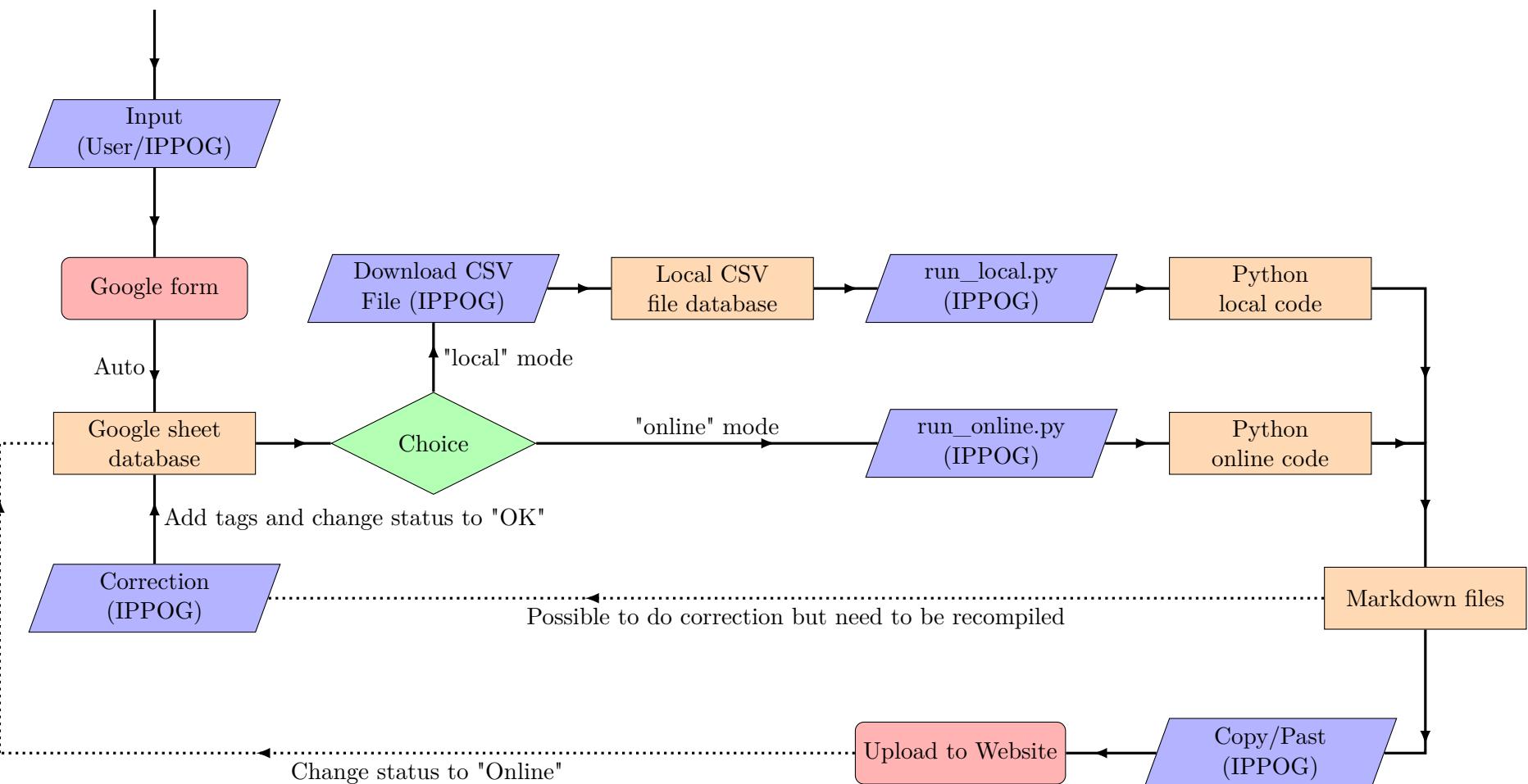


Figure 3.0.1: Flowchart of the upload process

### 3.1 Submitting projects through the Google Form

To facilitate the filling of the database, it was decided to use the option of linking a Google form to a Google Sheet document. It allows to guide the user through the form (Fig. 3.1.1), and to automatically fill the database on Google Sheet.

All fields of the form are detailed in Table 3.1, with a description and whether the field is mandatory or not. It is important that the user follows the explicit format, in the case of the authors: "Author1,Affiliation1\n" and write the full URLs including "http". Otherwise, the Python code formatting the database will not understand and will not recognize it.

**Explore the foundations of the universe!**

## Particle Physics Outreach Success Story Submission

The International Particle Physics Outreach Group (IPPOG) is a global network of researchers, educators and communication specialists working together to develop and share best practices in science education and public engagement.

Our school programmes, including [International Masterclasses](#) and [Global Cosmics](#), reach thousands of students, each year, instilling them with an appreciation for fundamental research and a deeper understanding of the scientific process, while our outreach activities foster public support for particle physics and related fields around the world.

Please use this form to submit your inspiring stories of particle physics outreach projects ! You can find examples of projects on the [website](#).

Note that the success story must ideally have been presented during a scientific conference (IPPOG Meeting, ICR, ICHEP..)

**Name of the project in English \***

Votre réponse

**Name of the project in its original language**

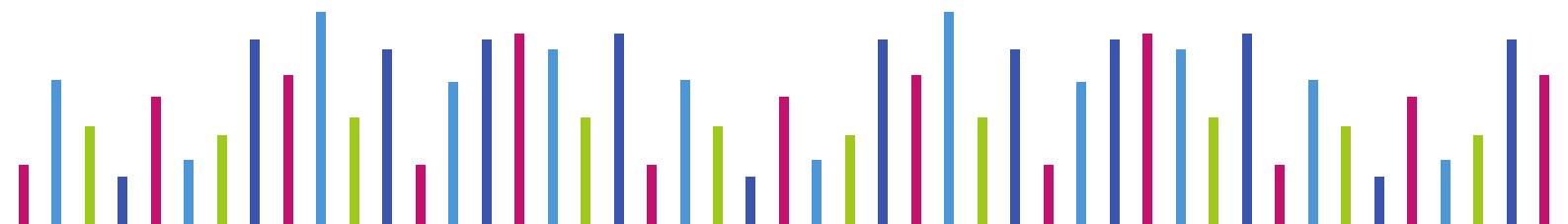
Votre réponse

**Featured image for the success story**

Please submit a link to the image or a way for us to download it (via CERNbox, Drive, extract from a PDF file...)

Votre réponse

Figure 3.1.1: Google form interface



Name	Mandatory	Description
<b>Main</b>		
Name of the project in English	✓	
Name of the project in its original language		
Featured image for the success story		Link to the image or a way for us to download it
Credit of the featured image		
Abstract of the Project	✓	Abstract should be about 500 characters
<b>Contact</b>		
Authors of the project and affiliations	✓	<p>The input should take the form:            Author1,Affiliation1            Author2,Affiliation2            ...            With one author per line with no space, otherwise it will not be recognized by the python code</p>
Public contact	✓	If an email is given, the @ sign should be replaced by "[ at ]" on the website (this is done automatically by the python program)
Private contact for the core team		This should not appear on the website, only in the private database
Status of the project	✓	multiple choice
<b>Presented conference / meeting</b>		
Name of the conference / meeting		
Year of the conference / meeting		
URL to the presentation slides / publication		
<b>Related resources</b>		
Other project resources		<p>The input should take the form:            ResourceName1:URL1            ResourceName2:URL2            ...            With one resource per line and URL beginning by http, otherwise it will not be recognized by the python code</p>
<b>Categories</b>		
Type of the project	✓	check box
Topic of the project	✓	check box
Audiences	✓	check box
Languages of the project		
Related IPPOG countries, experiments or laboratories		check box

Table 3.1: Description of the Google form fields

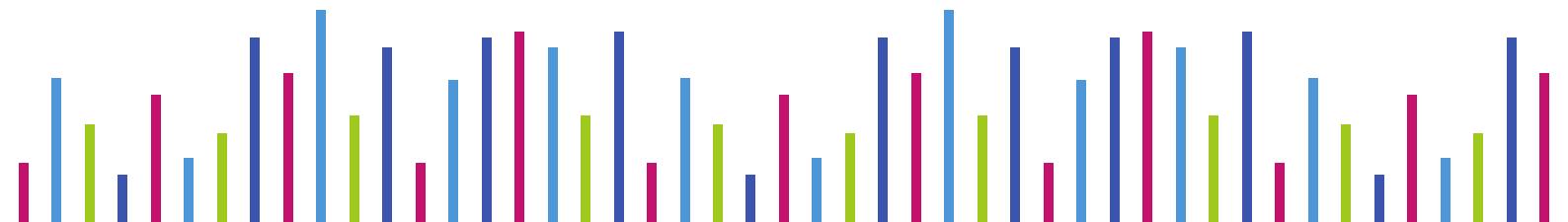
### 3.2 Registering the projects in the Google Sheet Database

The choice of using a database was to be able to easily archive it in CERNbox or other cloud, in case of data loss, but also to enable the scientific community to submit their projects that can then be validated or completed by the core team or the person responsible for the resource portal.

The database is composed of 5 pages:

- *Réponse au formulaire 1*: The raw submitted data from the Google Form appears here.
- *Work in progress*: Is a transit page where the raw data can be modified without touching the *Full database*.
- *Full database*: Is the actual data (Table 3.2). A few columns need to be modified manually by the user:
  - First, the user should clear the content of the first column "Horodateur" from *Réponse au formulaire 1* and copy and paste the data to a new empty line.
  - Column A "ID" should be given an unused ID.
  - Columns B to T should already be filled.
  - Column U "Sub Type" and V "Sub Topics" should be given related tags according to the taxonomy (Sec. 1.2).
  - Column W "WordPress page" should automatically update with the ID from column A, if not, the user can copy the formula from the cell above.
  - Column X "State" should be updated by the user according to the state of the WordPress page (note that the state should be "OK" for the line to be read by the Python code (Section 3.3)).
- *Proposition*: Is a list of projects that were either rejected or put aside for later.
- *Copy of Full database*: Is a copy of the *Full database* page.

The database is then read by a Python code (Section 3.3) that produces one formatted markdown file per project.



Column	Name	Google Form	Manually	Description
A	ID		✓	Needs to be manually added according to the previous project ID
<b>Main</b>				
B	Name of the project in English	✓		
C	Name of the project in its original language	✓		
D	Featured Image		✓	User gives a means to download the image, but the core team needs to upload the image in CERNbox and put the shared link here
E	Credit of the featured image	✓		
F	Abstract	✓		
<b>Contact</b>				
G	Author names,affiliation	✓		
H	Supporting entities		✓	Deprecated but kept in case it would be needed again
I	Public contact	✓		
J	Private contact	✓		
K	Project Status	✓		
<b>Presented conference / meeting</b>				
L	Name of the conference	✓		
M	Year of the conference	✓		
N	Presentation Documents	✓		
<b>Related resources</b>				
O	Other resources	✓		
<b>Categories</b>				
P	Type	✓		
Q	Topics	✓		
R	Audiences	✓		
S	Language	✓		
T	Related IPPOG member	✓		
U	Sub Types		✓	Should be completed using the types map
V	Sub Topics		✓	Should be completed using the topics map
<b>Private</b>				
W	WordPress page		✓	URL to the WordPress page: <a href="https://ippog-resources-portal.web.cern.ch/project-{Column A}">https://ippog-resources-portal.web.cern.ch/project-{Column A}</a>
X	State		✓	Should be updated depending (see above)

Table 3.2: Description of the database per columns

### 3.3 Formatting the projects with a Python code

The code is available in github:

```
1 git clone https://github.com/Troy314/IPPOG_Website.git
```

- `dictionaries/member_dictionary.py` is a dictionary which take the entry from Column T "Related IPPOG member" and return the url to the corresponding page in the IPPOG website<sup>1</sup>.
- `run_local.py` & `run_online.py` files are the codes that create the markdown files.
- `output_markdown/` is the folder in which markdowns are created.
- `exemple_file.csv` is an exemple database that can be used to test the run codes.

#### 3.3.1 Dependencies

Libraries needed to run the code are:

```
1 python3 -m pip install python-csv DateTime pathlib2
```

Optional parts of the code makes use of Google Sheets API and needs:

```
1 python3 -m pip install gspread google-auth google-auth-oauthlib google-auth-
httpplib2
```

#### 3.3.2 Running

Two version of the code are available

- `run_local.py` : directly extract data through Google's API (need the optional dependencies)
- `run_online.py` : extract data from a local CSV file

##### Online mode

/!\ Require the use of Google API, see Sec. 3.3.3.  
/!\ Require optional dependencies, see Sec. 3.3.1  
/!\ The JSON file should be put in the same folder as the run file

To run the program, simply run

```
1 python3 run_online.py
```

##### Local mode

/!\ Require to download the database available on Google sheet<sup>2</sup> as a CSV file  
/!\ The CSV file should be put in the same folder as the run file

To run the program, simply run

```
1 python3 run_local.py
```

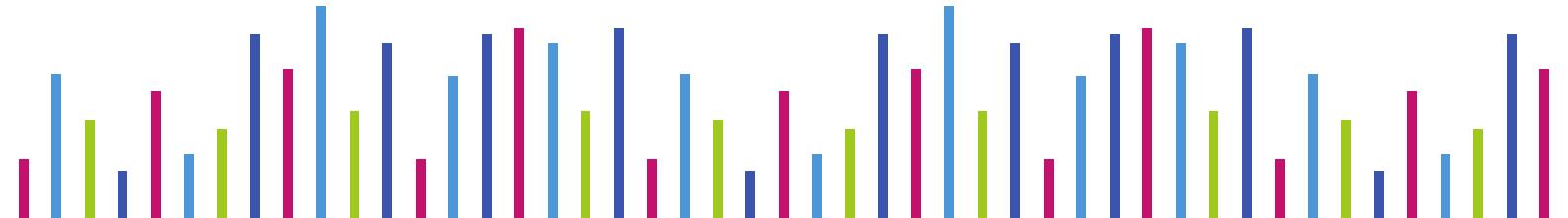
The codes will then ask the name of the CSV file containing the database.

Once you run the code, you have two options:

- Press [Enter] and run through all projects of which **Status = "OK"** (column X of the database), or
- Enter a number, the ID of a project, to force the code to run through a specific project

<sup>1</sup>Members and people of the IPPOG Collaboration: <https://ippog.org/about/ippog-members-and-people>

<sup>2</sup>Google Sheet: <https://shorturl.at/sHBrz>



The code finally produces an *output\_markdown* folder in which each markdown file corresponds to a project. The text of each of them should be copied into a new post of the website.

### 3.3.3 Enabling Google Sheets API

This section is about how to use the "online" versions of the code, using the Google API. /!\ If you are using the "local" version of the code, or if you already have the JSON file, you can skip this part.

To extract the data from the Google Sheets database, the Google Sheets API needs to be enabled and obtain credentials<sup>3</sup>.

#### Enable API Access

1. Go to the Google Cloud Console<sup>4</sup>.
2. Create a new project (or select an existing one).
3. Navigate to APIs & Services > Library.
4. Search for Google Sheets API and enable it.
5. Also, enable the Google Drive API (needed for file access permissions).

#### Create Service Account Credentials

1. Go to APIs & Services > Credentials.
2. Click on Create Credentials > Service Account.
3. Assign it a name and click Create & Continue.
4. Under "Grant this service account access," select Reading role (optional but useful).
5. After creating, go to the Keys tab and click Add Key > JSON.
6. Download the JSON file (keep it secure).

#### Share Your Google Sheet

1. Open the Google Sheet where the database is located.
2. Click Share and add the email address from the service account JSON file.
3. Set permissions to Reading.

## 3.4 Uploading the projects on the Website

The following section will cover how to upload the data generated by the Python code onto the website. However, it will not explain how to maintain the WordPress infrastructure generally. More information can be found at CERN WordPress Documentation<sup>5</sup> and in the dedicated Mattermost channel<sup>6</sup>.

A video guide<sup>7</sup> covering the uploading steps is also available.

---

<sup>3</sup>Courtesy to Mayank Gupta: [dev.to/mayankcse/google-sheets-integration-with-python-a-step-by-step-guide-2mdb](https://dev.to/mayankcse/google-sheets-integration-with-python-a-step-by-step-guide-2mdb)

<sup>4</sup>Google Cloud Console: <https://console.cloud.google.com/>

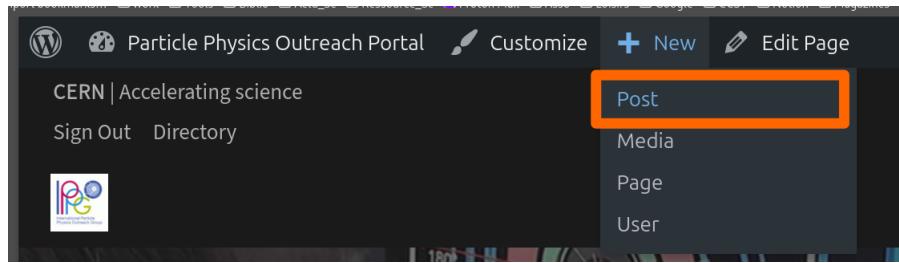
<sup>5</sup>CERN WordPress Documentation: <https://wordpress.docs.cern.ch/>

<sup>6</sup>Mattermost channel: <https://mattermost.web.cern.ch/it-dep/channels/wordpress>

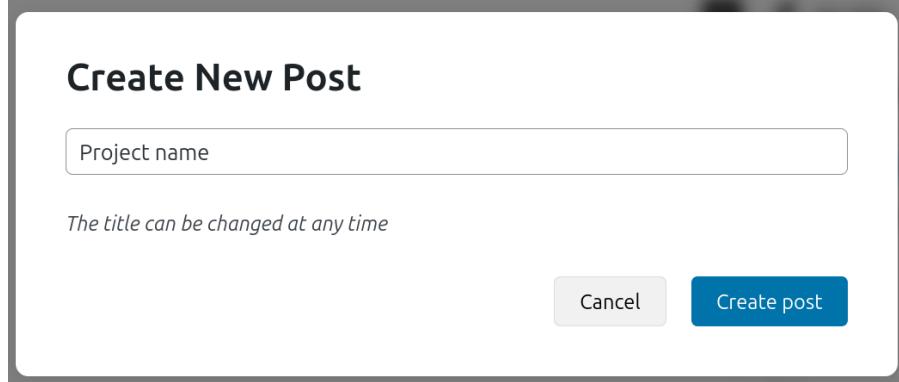
<sup>7</sup>Video guide: [https://www.youtube.com/watch?v=OQ6QYBG\\_MYU](https://www.youtube.com/watch?v=OQ6QYBG_MYU)

### Create a new post

1. Go to the website: <https://ippog-resources-portal.web.cern.ch/>
2. Click [New] > Click [Post] (Fig 3.4.1a) > Use the name of the project as the title (Fig 3.4.1b)
3. Delete the title so the post is blank
4. Copy the content of the Markdown and paste it on the Post using the command [Ctrl + Shift + V] to keep the page layout. It should look like the Figure 3.4.1c



(a) Create a new Post



(b) Give it a Name

```
[draft] title : The ATLAS4Teachers open data app
[draft] run /media & text with the "show media on the right"
[draft] run /title in left column
[draft] choose "featured image" in right
[draft] link to image : https://cernbox.cern.ch/s/wPnAUZdAH61WUfD
[draft] run ragged right for credit
Credit :
```

### Abstract

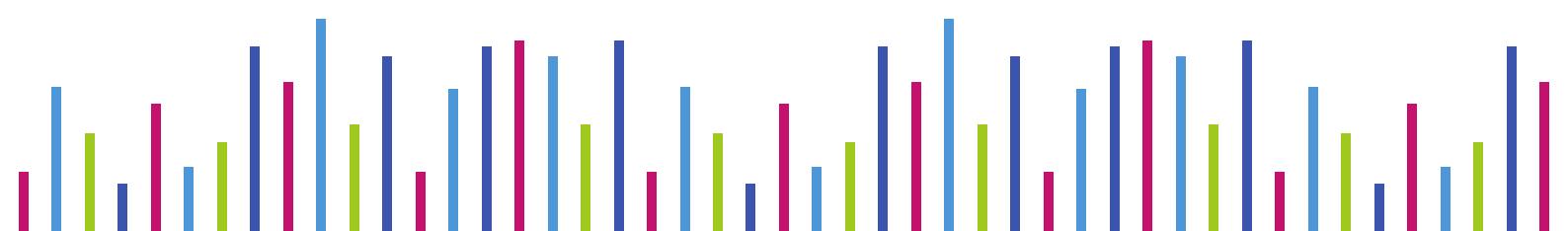
The ATLAS outreach and open data group developed a new workshop based on the Knowledge Gap Theory: making it easier for people to find knowledge can make a significant difference.

To expand the reach of open data, the team made the documentation accessible in Spanish and Italian through a newly developed online app, ATLAS4Teachers, and organized workshops for teachers to spread knowledge.

- [29th IPPOG Meeting \(2025\)](#)

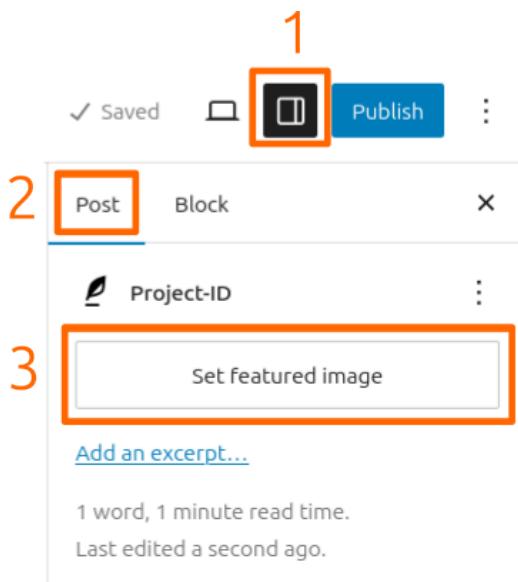
(c) Final render

Figure 3.4.1: Create the post

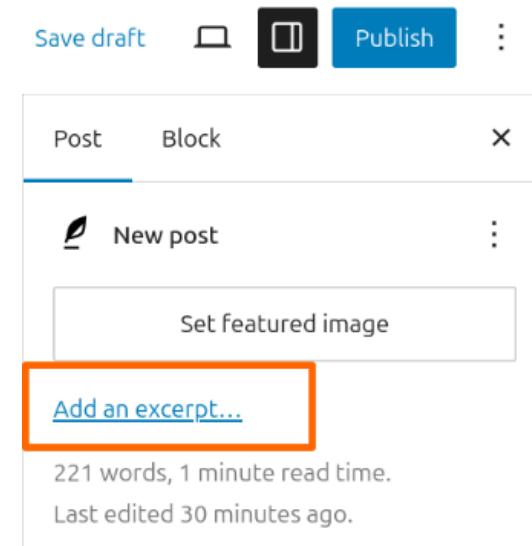


### Update the settings of the Post

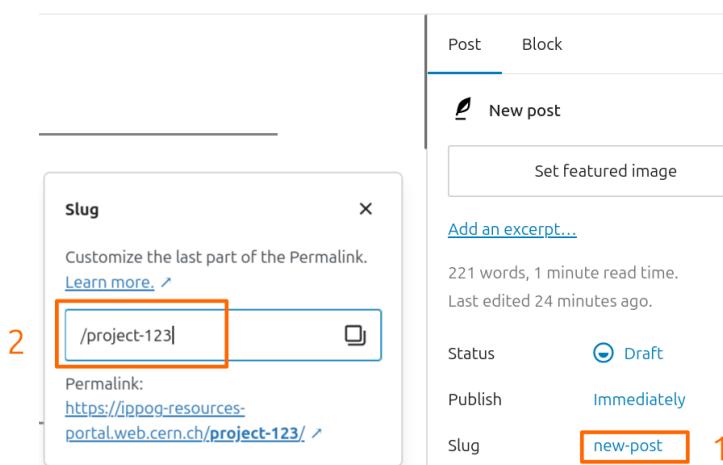
1. Open the [Settings of the Post] > Click [Post] > Upload the image using [Set featured image] (Fig 3.4.2a)
2. Copy the Abstract
3. Click [Add an excerpt...] > Paste the Abstract (Fig 3.4.2b)
4. Click on the Slug > Change it to project-ID with the ID of the project (Fig 3.4.2c)
5. The settings should then look like Figure 3.4.2d



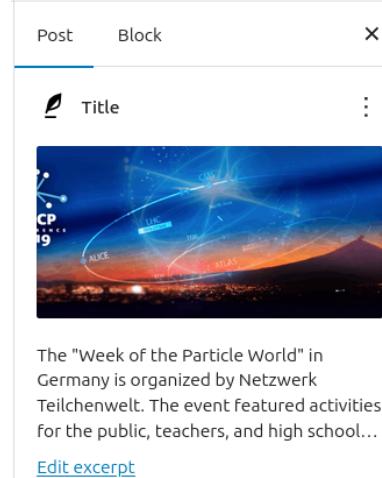
(a) Set featured image



(b) Change excerpt

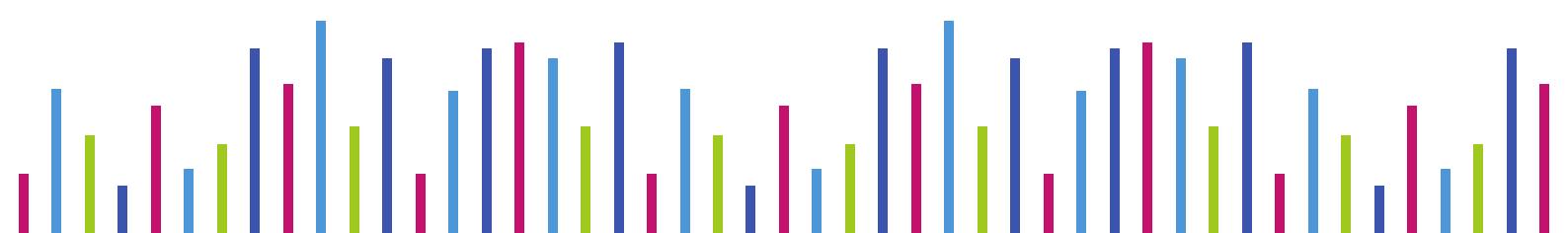


(c) Change the slug



(d) Final settings render

Figure 3.4.2: Settings



### Format the title field

1. Create a block /media & text
2. Select [Use featured image] > [Show media on the right] (3.4.3a)
3. Create a block /Title on the left text field and choose [H1 size]
4. (optional) Write the subtitle in [H2 size] if there is one
5. Put the Credit text [aligned right]
6. Remove all the text beginning with [draft] (3.4.3b)



(a) Media &amp; Text block

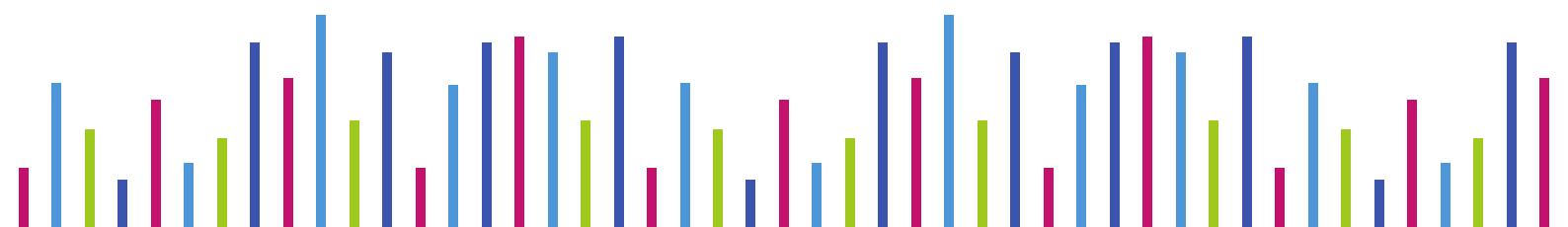
**Title**  
**Subtitle**



Credit : [Netzwerk Teilchenwelt](#)

(b) Final rendering of the title field

Figure 3.4.3: Title field



### Complete the categories and tags field

1. Create blocks `/categories` and `/tags`
2. Respectively add "Categories: " and "Tags: " as prefixes (Fig 3.4.4a)
3. Open the [Settings of the Post] > Click [Post] > Remove "Miscellaneous" and complete the missing tags and categories (Fig 3.4.4c)
4. Remove all the text beginning with [draft]
5. Change the length of Separators to wide
6. Finally, publish the article as it is (Fig 3.4.4b)

The figure consists of three screenshots labeled (a), (b), and (c) illustrating the upload process.

(a) Tags and Categories display:

- Categories:** [Miscellaneous](#)
- Tags:** [Antimatter](#), [Board game](#), [Festival](#),
- Post Settings:** Shows a list of categories and tags. **Miscellaneous** is checked under Categories. Under Tags, **Antimatter**, **Board game**, **Neutrino**, and **Standard model of elementary particles** are checked.

(b) Publish the Post:

Post settings interface showing the **Publish** button highlighted with an orange box.

(c) Tags and Categories settings:

Post settings interface showing the **Categories** and **Tags** sections. The **Categories** section shows a search bar and a list of categories. The **Tags** section shows a search bar and a list of tags, with several options checked.

Figure 3.4.4: Uploading the projects

# Chapter 4

# Data visualization

To visualize the data more easily, multiple tools were developed. An infographic displaying the relationships between tags and categories is created using FraMindmap (Sec. 4.1) and pie charts (Sec. 4.2) are plotted using Python code to visualize the diversity of projects uploaded on the website.

## 4.1 Types & Topics map

The mind-map that links tags with their categories (Fig. 1.4.1 & 1.4.2) is available in FraMindmap<sup>1</sup> (Fig. 4.1.1). It can be easily downloaded as an SVG file or a PNG. A global taxonomy is also available<sup>2</sup>.

/!\ To modify the mind-map, an account is needed. At the moment this document is written, no better alternative was found.

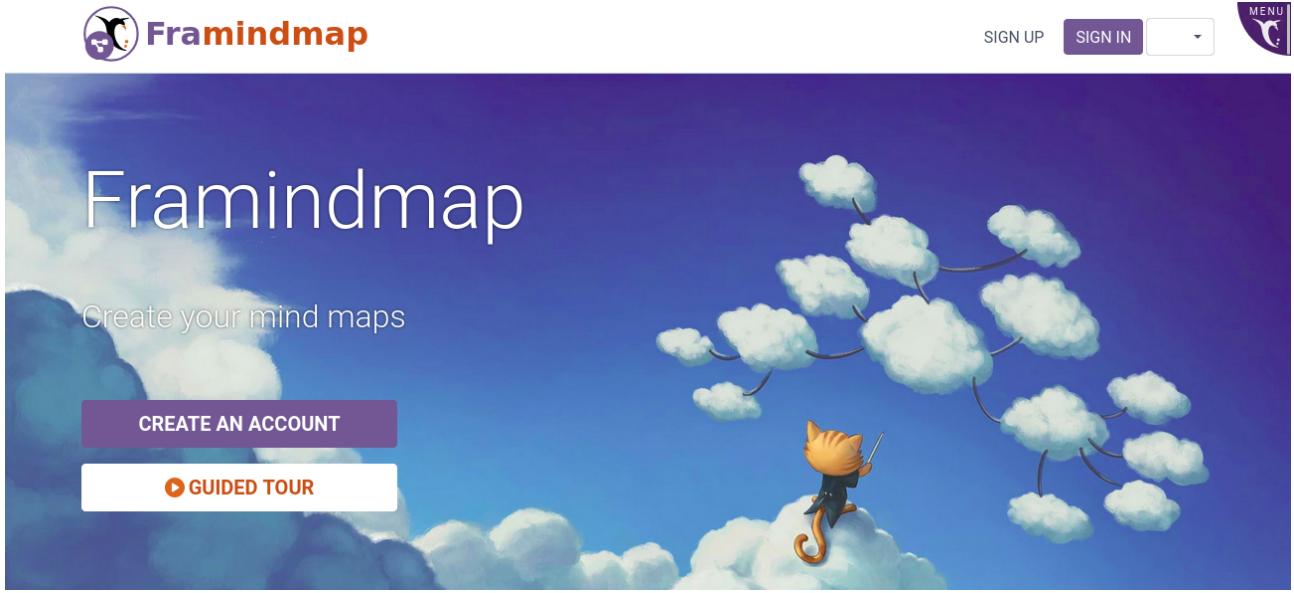
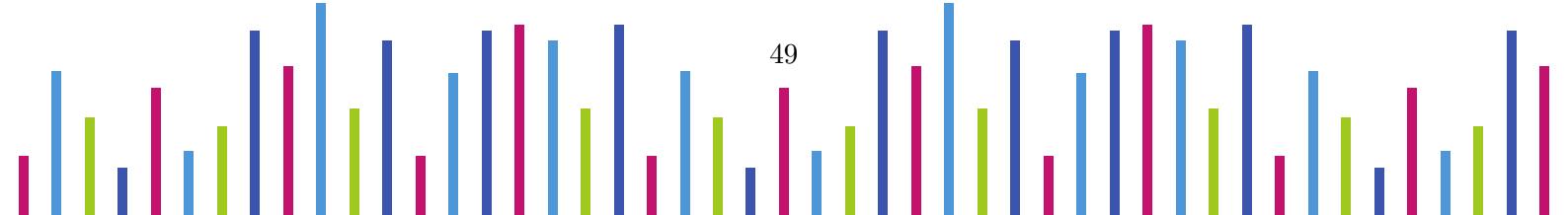


Figure 4.1.1: Framindmap soft

<sup>1</sup>FraMindmap Types & Topics taxonomy: <https://framindmap.org/c/maps/1527084/edit>

<sup>2</sup>FraMindmap Global taxonomy: <https://framindmap.org/c/maps/1531458/edit>



## 4.2 Data visualization

The code is available in GitHub:

```
1 git clone https://github.com/Troy314/IPPOG_Website.git
```

- `data_topics_dictionary.py`, `data_types_dictionary.py`, `data_representatives_dictionary.py` are dictionaries that count respectively the topics and types of the projects as well as the IPPOG members related to each project.
- `data_analysis_local.py` & `data_analysis_online.py` files are the codes that create the graphs. They go through all items of the database of which [Status = "Online"] and display pie charts online projects.
- `media/data` is the folder where graphs are saved as SVG files

Two versions of the code are available

- `data_analysis_local.py`: directly extract data through Google's API (need the optional dependencies)
- `data_analysis_online.py`: extract data from a local CSV file

### Online mode

`!\\` Requires the use of Google API, see Sec. 3.3.3.  
`!\\` Requires optional dependencies, see Sec. 3.3.1  
`!\\` The JSON file should be put in the same folder as the run file

To run the program, simply run

```
1 python3 data_analysis_online.py
```

### Local mode

`!\\` Requires to download the database available on Google sheet<sup>3</sup> as a CSV file  
`!\\` The CSV file should be put in the same folder as the run file

To run the program, simply run

```
1 python3 data_analysis_local.py
```

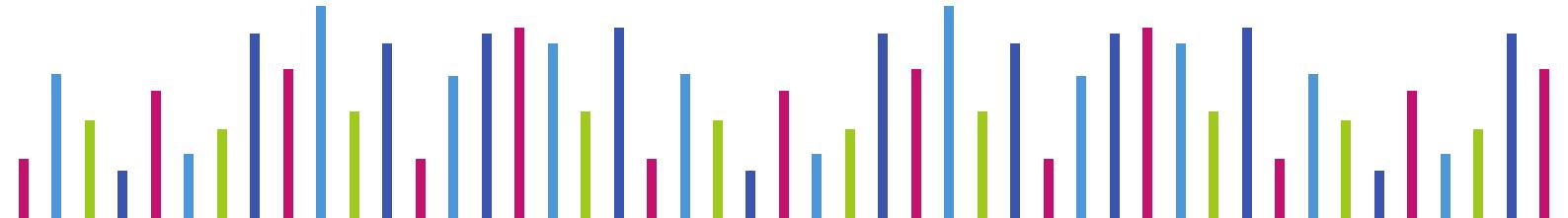
The codes will then ask for the name of the CSV file containing the database.

The codes produce a `media/data/` folder in which three SVG files are produced:

- Related members data (Fig. 1.4.3)
- Topics data (Fig. 1.4.4)
- Types data (Fig. 1.4.5)

---

<sup>3</sup>Google Sheet: <https://shorturl.at/sHBrz>



# Chapter 5

## Useful Links

GitHub Repository with all Python codes, media files, and Guidelines:

- [https://github.com/Troy314/IPPOG\\_Website](https://github.com/Troy314/IPPOG_Website)

Google form that collects the raw data:

- Public: <https://shorturl.at/Ngf21>
- For edition: <https://shorturl.at/gtkGW>

Google sheet which hosts the raw database:

- <https://shorturl.at/sHBrz>

Taxonomy graph available on FraMindmap app:

- Public: <https://framindmap.org/c/maps/1527084/public>
- For edition: <https://framindmap.org/c/maps/1527084/edit>

IPPOG Websites:

- Resource database: <https://ippog-resources-portal.web.cern.ch/>
- General Website: <https://ippog.org/>

Contact:

- Claire.Adam.Bourdarios [at] cern.ch

