International Particle Physics Outreach Group

WG on Applications for Society

Report from WG 1st Hacathon and WG meeting/activities

Sofia Tech Park

Barbora Bruant Gulejova & Yiota Foka

(Conveners)

10 May 2023

Executive summary on WG's news

1st Hacathon of IPPOG's WG on Applications for Society (26-27 January 2023)

Worked out Stories in https://drive.switch.ch/index.php/s/fXBx4zL1cPhagbT

Description of WG for web pages sent to WG for comments and delivered

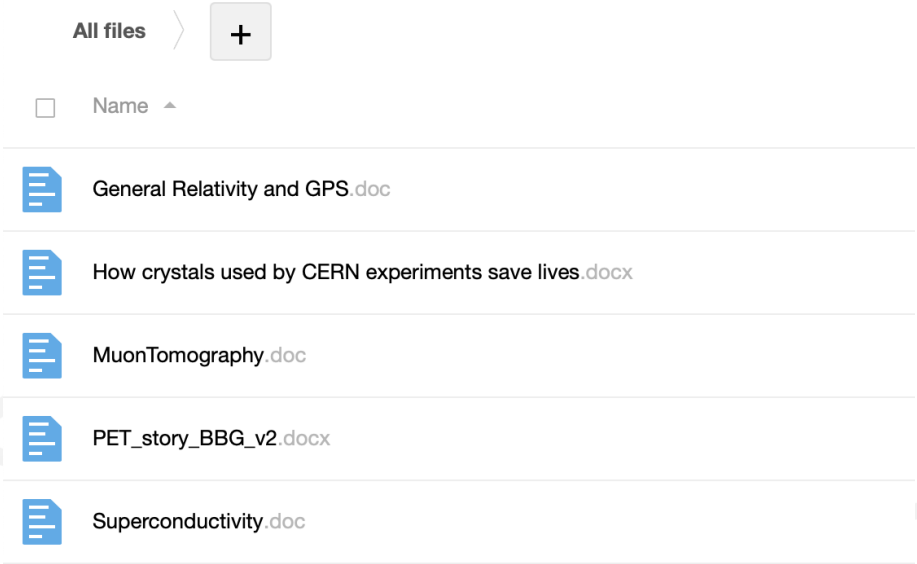
Re-confirmation of WG active members: on-going
Re-activate, re-establishing reading/editorial group: to be done

Proposal for 2nd Hacathon:
20-22 sep or 2nd-3rd week oct (preference oct)

Hacathon experience

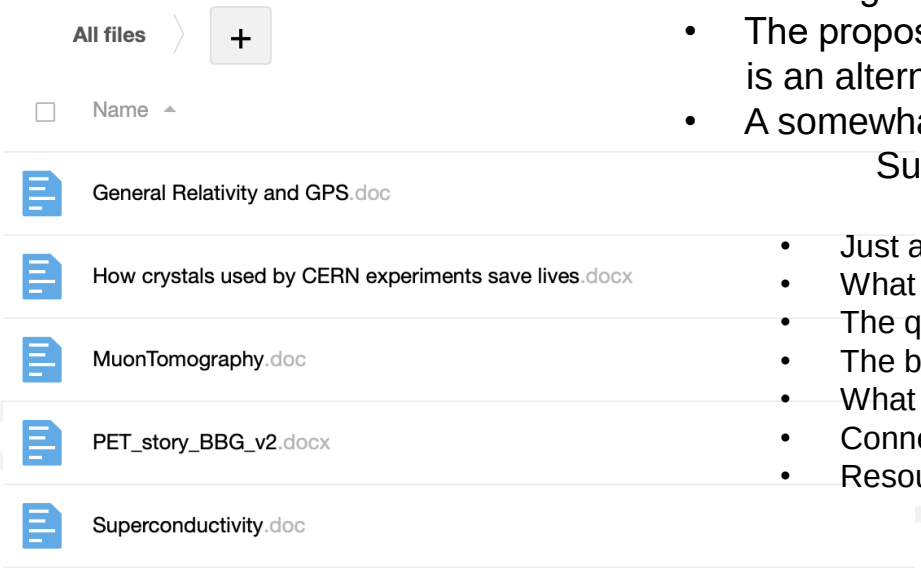
Easy to work in a team: accomplised some work

Started from (a) stories where text existed (b) story where resources existed



Hacathon experience

Doing the actual work, faced with some questions



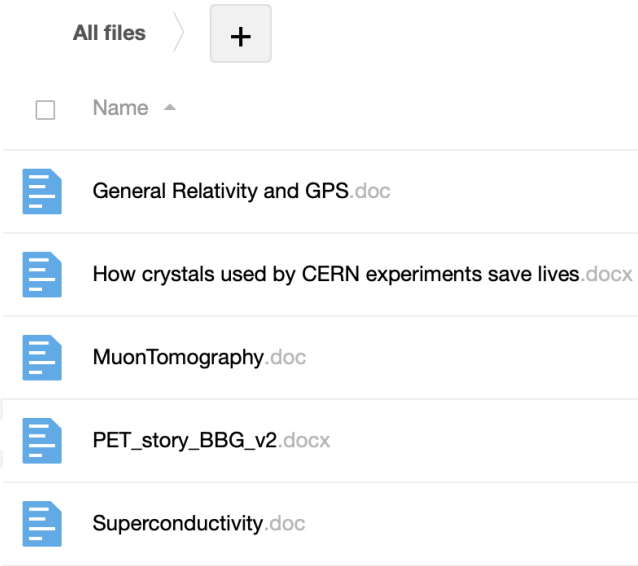
- The original guideline of “2 pages” seems too short
- The proposal to have “2 pages” plus an addendum for details is an alternative but does not seem to work very well either
- A somewhat longer text seems to work best:

Superconductivity (4 pages)

- Just a dream or already a reality?
- What is a super-conductor
- The quest is on
- The breakthrough
- What is good for
- Connection to IPPOG
- Resources/links: videos, easy to digest text, more advanced text

Hacathon experience

Doing the actual work, faced with some questions



Not clear always:

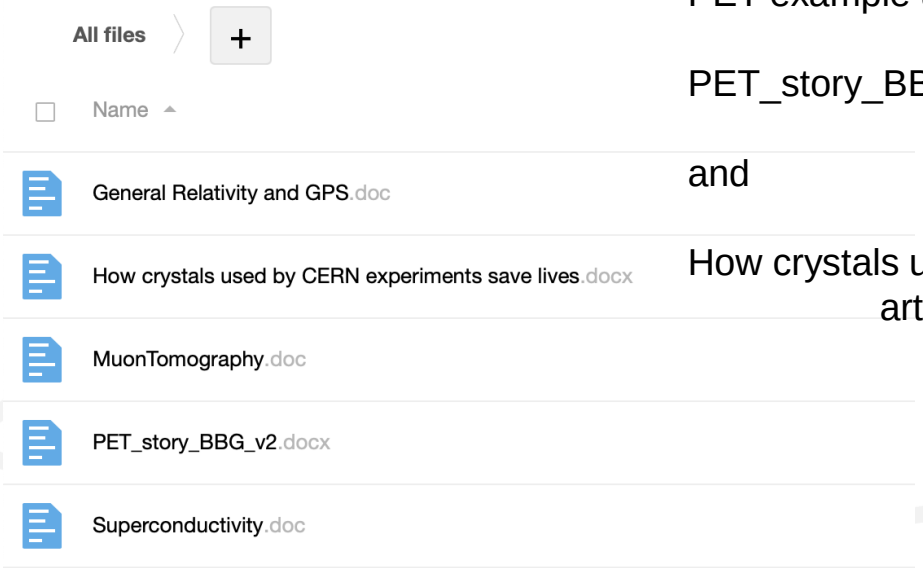
- how to make the IPPOG connection
  (personal experiences, anecdotes)
- how to avoid biases and give credit to previous works
  (i.e. case of PET)
- how to avoid becoming too technical, or too detailed
  (use hypertext for extra explanations)
- how to avoid repeating wikipedia….

Who is our audience: general public

- Funding agencies: few lines to pass message
- Teachers and students: pedagogical, resources
- Broader society, any citizen: inject an element to catch attention, something to remember (emotional memory)

Hacathon experience

Doing the actual work, faced with some questions



PET example and iterations

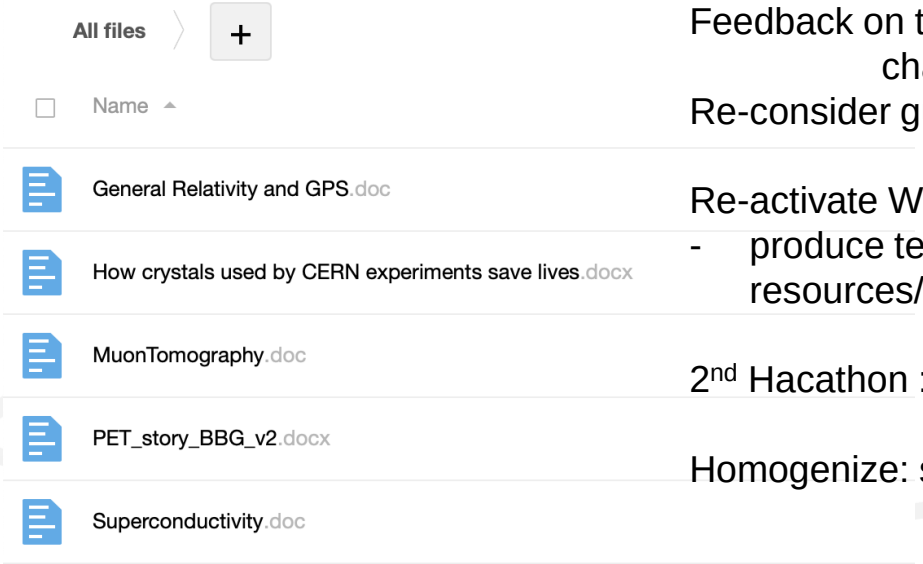
PET_story_BBG_v2

and

How crystals used by CERN:
article for separate publication in a magasin by BG

Next steps

Need for external feedback



Feedback on these stories
chairs, re-establish reading group, everybody
Re-consider guidelines

Re-activate WG:
- produce text/stories on further topics from provided resources/presentations

2nd Hacathon : as in 1st one with reconsidered guidelines

Homogenize: style and looks

Reminder of material and WG collections

Recent presentations by BG

24th IPPOG Meeting (26-October 28, 2022) · Indico (cern.ch)

https://indico.cern.ch/event/1185824/contributions/5114731/attachments/2536303/4367682/IPPOG_WG_Application_Society_28_10_2022_BBG.pptx

Presentation on IPPOG in May 2022:

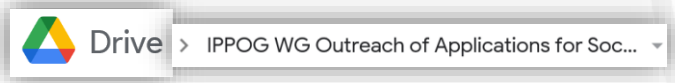
https://indico.cern.ch/event/1139538/contributions/4853321/attachments/2442941/4185455/IPPOG_WG_Applications_to_Society_Meeting_Report_May_2022_BBG.pptx

November 2021:

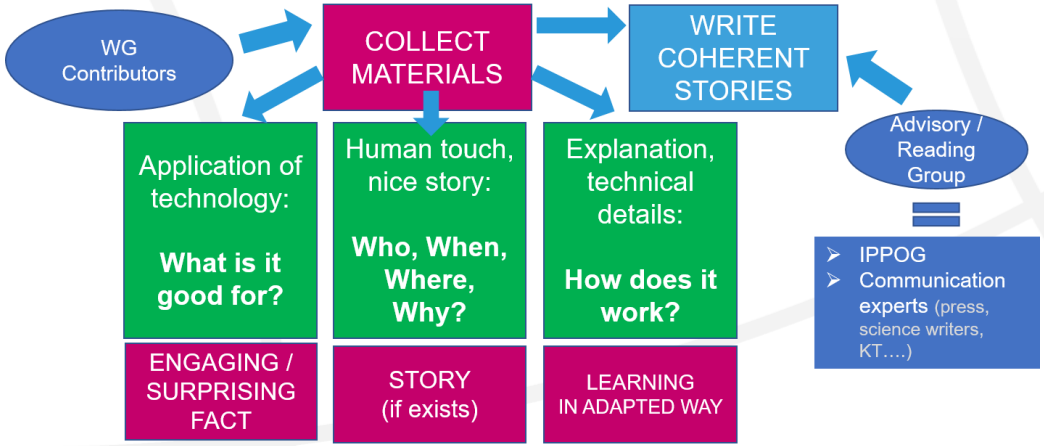
https://indico.cern.ch/event/1084892/contributions/4561399/attachments/2346975/4002299/IPPOG_WG_Applications_to_Society_Meeting_Report_Nov_2021_BBG_v1.pptx

Original guidelines

- Resources: quite big collection on WG



- Format:
  - stories (Abstract, Body, Pictures, Resources, Related links, …)
  - 1-2 pages



Drive

IPPOG WG Outreach of Applications for Soc...

WG's COLLECTED MATERIALS / STORIES on impact on society: working document

Lot of materials for stories collected and few drafts written (GPS, PET, superconductivity, UNOSAT,...)

IPPOG Application Stories

- Sign up for the topic where you want to contribute
- Propose new topics

TOPIC	RESOURCES	COMMENT	PERSON	STATUS
All applications	General resources			
Medical applications	General medical applications resources			
PET	Material from Martin Wensveen (CERN) here -Interview to be done later; -Maybe include CAEN PET scanner kit -Presentation by Despina 29 Nov 2019 here	PET using new type of dense scintillating crystals; CERN has pioneer contribution to forerunner of PET	Yiota Despina Andrej	Draft
RMI		PET and MRI imaging combined in single device thanks to new generation of CERN detectors		
Hadron therapy	Material from Hans Specht (GSI) here + interview to be done later More materials here	Treating tumours with beams of protons and light ions reducing the radiation exposure of healthy issue (3 HT centres in Europe built in collaboration with CERN; CERN supports development of miniature linear accelerators for proton therapy) Kraft (presentation)	Katharina Bulatovic	HT story
Precise dose calculations based on particles simulations		Software for simulating particles interactions in detectors -used to calculate precise radiation dose for cancer treatment - space applications		
MEDIPIX	Info here	medical diagnostics, industrial processes, X-ray based material analysis, X-rays by detectors invented by Charpak in 1968 need fraction of dose required by photographic methods, International Space Station	Yiota	

MEDICIS (Radioisotopes treatment and diagnosis)			Barbora	
Other applications	General resources			
WWW	Text for article for slovak newspaper in Slovak language, Barbora Bruant Gulejova:here	Invention at CERN (1993) driven by need of better communication of scientist worldwide, had a huge impact: # of internet users from 14 millions to 3.2 billions from 1993 till 2015- contribution to 2,9% of world global GDP ~ 1672 billion US$ (in 2011)	Barbora Teddy	
Touchscreen	Article here	CERN was pioneer in breakthrough technologies, such as touchscreen for SPS in 1973	Thomas	
Solar cells technology	*Article in symmetry here*	Benvenutti working at CERN, Inspiration for solar cells technology based on ultra high vacuum - GVA airport, KT case, cautious as it went bankrupt	Barbora	
TERABEE		sensor technology used in drones to explore places with difficult access	Teddy	
INVENIO		digital library and document repository used by providing cloud based digital library system for UN		
CLOUD	Link 1 Link 2 Link 3 Link 4 Link 5 Link 6	exploring the influence of cosmic rays on cloud formation in the Earth's atmosphere giving important input to global climate models	Katharina	
Radiation protection		Dosimeters and other applications		

UNOSAT	Notes from BBG here	In cooperation with UN, CERN provides the **IT infrastructure** to **UNOSAT** programme of UNITAR hosted at CERN, to be at te forefrtont of satellite analysis technology -15 years of humanitarian mapping: disaster risk reduction, regional capacity development, - damage assessment, climate services, water and food security	Barbora	
Superconductivity	Link 1 Link 2 Link 3 Link 4 Link 5 Renewable and sustainable... Volume 55, March 2016, Pages 59-72	Potential use for energy transport	Katharina	
Rolex antimagnetic watch	See link		Barbora Teddy	
Cultural heritage	Muon tomography,....		Despina Katia	
Accelerators for society	Medication, Sterilisation, Water purification... "Accelerators on ships" from "ARIES Accelerating News" See here		Yiota	
Detectors in industry				
WIFI	See here	Search for Hawking radiation	Jonivar	
GPS and Einstein Theories			Lorenzo	GPS story
GPS	GNSS Masterclass GNSS links	Example of simple GPS based masterclass for EEE high school students	Marina Trimarchi for EEE collaboration	

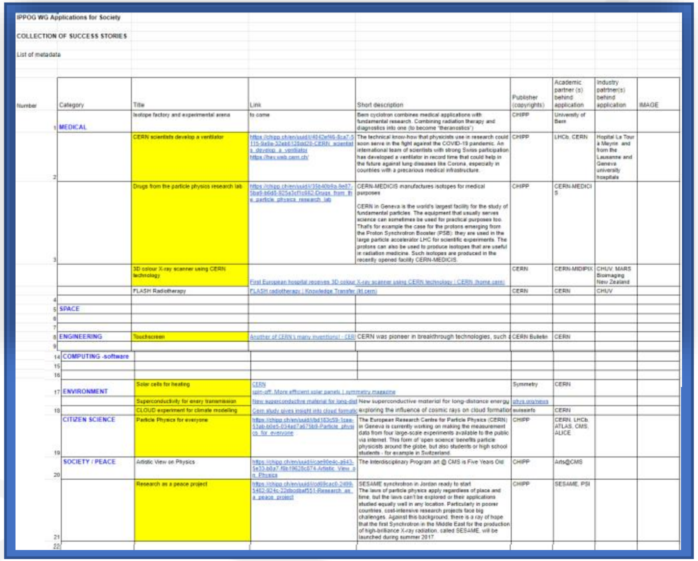
Hyperloop	link	Possible traveling of future	Lorenzo	
CAEN	Interview with Gianni (CAEN), more materials will be sent	Examples of their technologies used in industrial applications	Barbora	
CERN against COVID	Presentation from James Gillies at IPPOG here CERN against COVID19 seminar here Website CERN against COVID TF here			
LIP and COVID	Ricardo's presentation at IPPOG here			
Science response to COVID	Presentation from Savanah at IPPOG here Initiative "science responds" here			
Physics in the service of archeology	https://indico.cern.ch/event/942612/contributions/3962145/attachments/2082233/3497568/Alfaro.pdf		Jose Ruben Alfaro Molina	
Tesla	https://indico.cern.ch/event/942612/contributions/3960794/attachments/2082036/3497226/YF-TESLA-IPPOG-WG-29july2020.pdf		Yiota	
ATTRACT highlights	https://attract-eu.com/news-and-events/		Barbora	

And more…

International Particle Physics Outreach Group

Categorised collection of success stories with metadata

Google sheet to collect the coherent metadata: [Collection of success stories]



IPPOG WG Applications for Society

COLLECTION OF SUCCESS STORIES

List of metadata

Number	Category	Title	Link	Short description	Publisher (copyrights)	Academic partner (s) behind application	Industry patrtner(s) behind application	IMAGE
1	MEDICAL	Isotope factory and experimental arena	to come	Bern cyclotron combines medical applications with fundamental research. Combining radiation therapy and diagnostics into one (to become "theranostics")	CHIPP	University of Bern		
2		CERN scientists develop a ventilator	[illegible] https://hev.web.cern.ch/	The technical know-how that physicists use in research could soon serve in the fight against the COVID-19 pandemic. An international team of scientists with strong Swiss participation has developed a ventilator in record time that could help in the future against lung diseases like Corona, especially in countries with a precarious medical infrastructure.	CHIPP	LHCb, CERN	Hopital La Tour à Meyrin and from the Lausanne and Geneva university hospitals	
3		Drugs from the particle physics research lab	[illegible]	CERN-MEDICIS manufactures isotopes for medical purposes CERN in Geneva is the world's largest facility for the study of fundamental particles. The equipment that usually serves science can sometimes be used for practical purposes too. That's for example the case for the protons emerging from the Proton Synchrotron Booster (PSB): they are used in the large particle accelerator LHC for scientific experiments. The protons can also be used to produce isotopes that are useful in radiation medicine. Such isotopes are produced in the recently opened facility CERN-MEDICIS.	CHIPP	CERN-MEDICIS		
		3D colour X-ray scanner using CERN technology	First European hospital receives 3D colour X-ray scanner using CERN technology | CERN (home.cern)		CERN	CERN-MIDIPIX	CHUV, MARS Bioimaging New Zealand	
		FLASH Radiotherapy	FLASH radiotherapy | Knowledge Transfer (kt.cern)		CERN	CERN	CHUV	
4								
5	SPACE							
6								
7								
8	ENGINEERING	Touchscreen	Another of CERN's many inventions! - CERN	CERN was pioneer in breakthrough technologies, such a	CERN Bulletin	CERN		
9								
14	COMPUTING -software							
15								
16								
17	ENVIRONMENT	Solar cells for heating	CERN spin-off: More efficient solar panels | symmetry magazine		Symmetry	CERN		
		Superconductivity for enery transmission	New superconductive material for long-dist	New superconductive material for long-distance energy	phys.org/news			
18		CLOUD experiment for climate modelling	Cern study gives insight into cloud formatio	exploring the influence of cosmic rays on cloud formation	swissinfo	CERN		
19	CITIZEN SCIENCE	Particle Physics for everyone	[illegible]	The European Research Centre for Particle Physics (CERN) in Geneva is currently working on making the measurement data from four large-scale experiments available to the public via internet. This form of 'open science' benefits particle physicists around the globe, but also students or high school students - for example in Switzerland.	CHIPP	CERN, LHCb, ATLAS, CMS, ALICE		
20	SOCIETY / PEACE	Artistic View on Physics	[illegible]	The Interdisciplinary Program art @ CMS is Five Years Old	CHIPP	Arts@CMS		
21		Research as a peace project	[illegible]	SESAME synchrotron in Jordan ready to start The laws of particle physics apply regardless of place and time, but the laws can't be explored or their applications studied equally well in any location. Particularly in poorer countries, cost-intensive research projects face big challenges. Against this background, there is a ray of hope that the first Synchrotron in the Middle East for the production of high-brilliance X-ray radiation, called SESAME, will be launched during summer 2017.	CHIPP	SESAME, PSI		
22								

Categories:

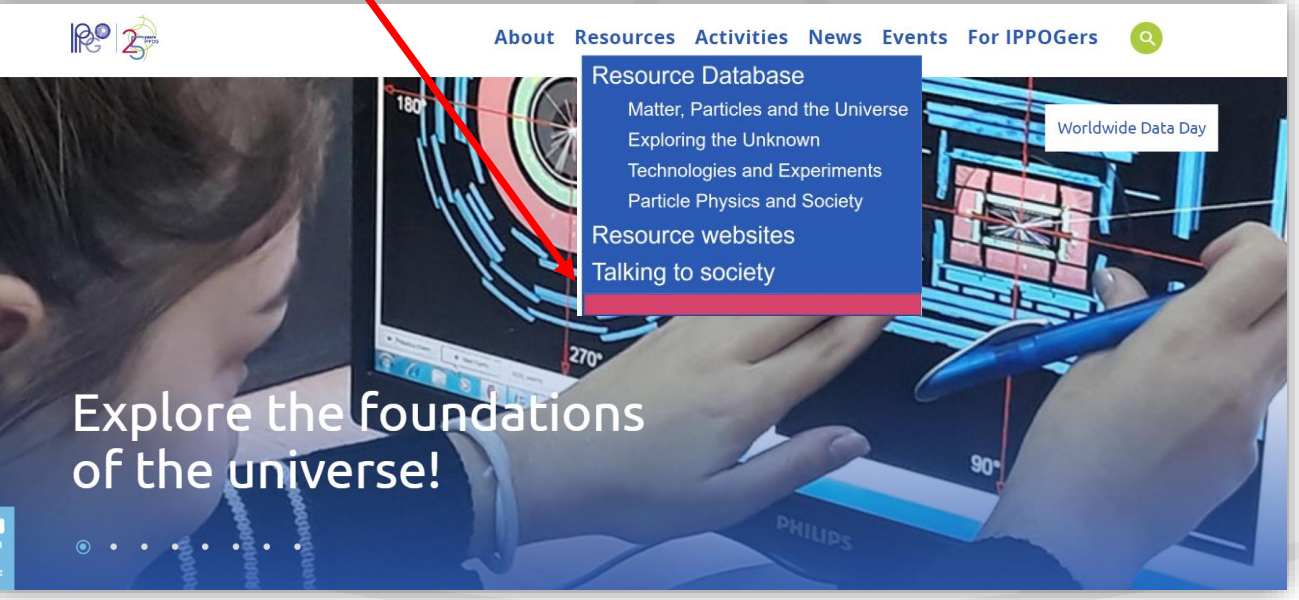
→ add to the dedicated IPPOG webpage

Thanks for help, Katharina

New dedicated page on IPPOG website

https://ippog.org/particle-physics-and-society

“Talking to society” - new submenu under the RESOURCES



USEFUL TOOL for COMMUNITY

- Developed from the original idea of IPPOG wisdom collection (proposed in 2017)
- Filled with content collected and made by IPPOG
- IPPOG WG on Applications for Society
- IPPOG WG on Explaining PP to lay audience

Dedicated content development efforts needed

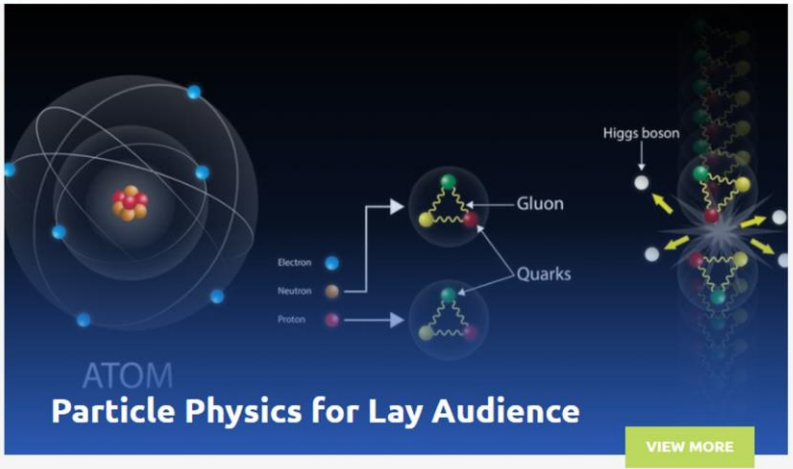
Resource Database
- Matter, Particles and the Universe
- Exploring the Unknown
- Technologies and Experiments
- Particle Physics and Society

Resource websites

Talking to society

Talking to society

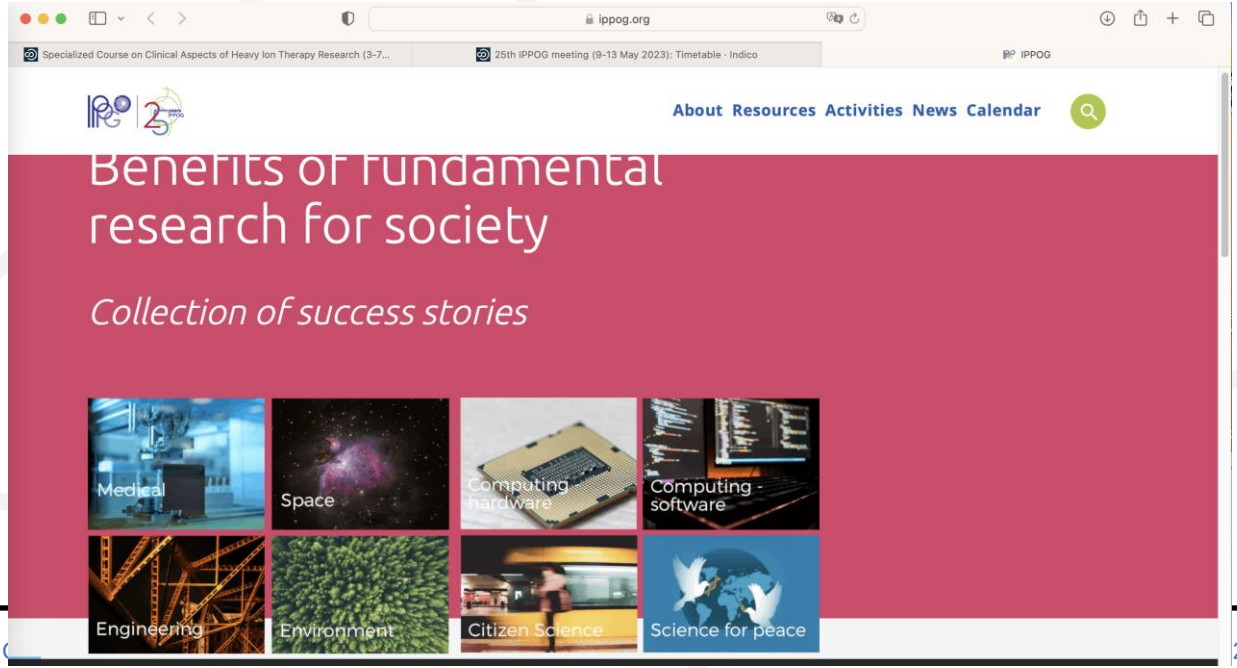
Collection of materials made or collected and recommended by IPPOG, useful for anybody who wants to communicate about particle physics and related science with lay audience (students, public, media, decision-makers, funding agengcies). You can find collection of knowledge transfer success stories about the applications from fundamental research for society and also the short articles written by IPPOG experts explaining the complicated matters of particle physics to lay audience (or non-particle physicist).



Talking to Society

https://ippog.org/success_stories

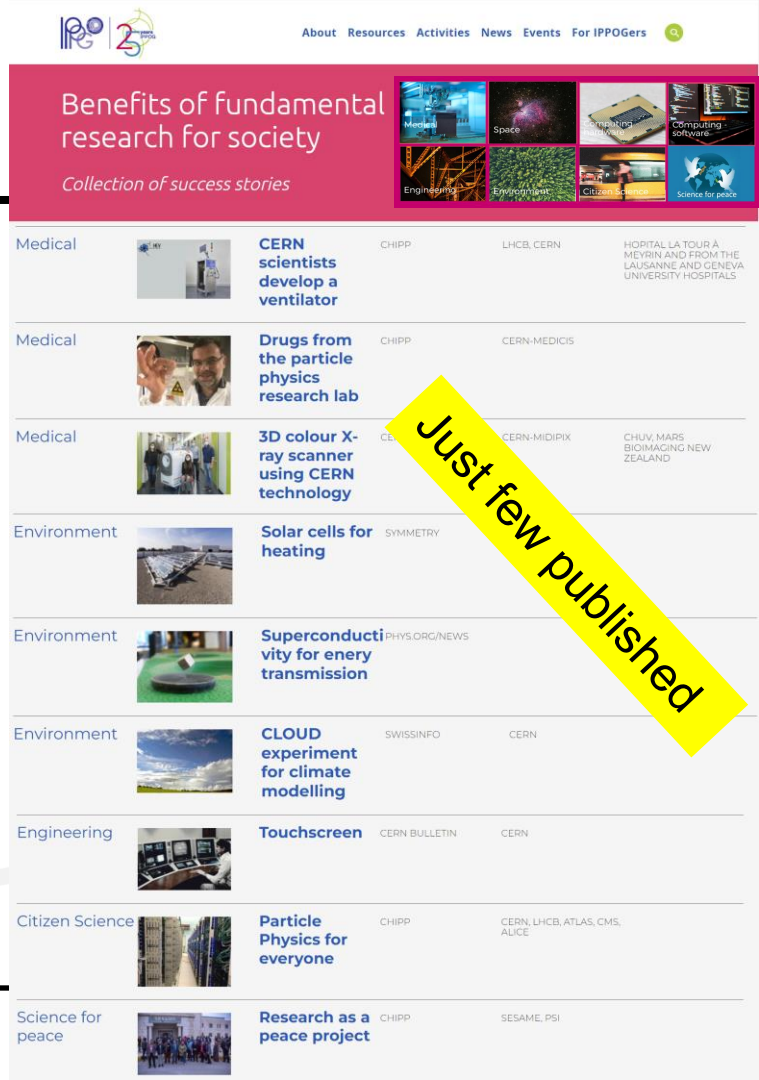
what done already thanks to our WG! One of the most visible deliverable !



Talking to society / Success stories

KT Success Stories beyond CERN

- Collection of best stories available (written in understandable language for lay audience), categorized and on one place (beyond CERN)
- Good match with UNESCO International Year of Basic Science for Sustainable Development
- More dedicated and consistent efforts needed to analyze collected materials and prepare more stories



CERN Accelerating science

Sign in Directory

HEV

HOME DESIGN NEWS MEDIA CONTACT HISTORY

HEV

High Energy physics community proposes HEV ventilator to help combat COVID-19

Developed in full consultation with medical professionals, HEV (High Energy Ventilator) is a high quality, versatile ventilator design. It has been developed to address the needs of COVID-19 patients.

CERN Document Server

Recherche Soumettre Aide Personnaliser

Another of CERN's many inventions!

Informations Discussion (0) Fichiers

Bulletin N°: 12/2010 & 13/2010, Mon 22 Mar 2010
>> version anglaise

BUL-NA-2010-063

Aussi dans ce numéro:

- Record d'énergie battu !
- 3.5 TeV : la patience paie
- La septième expérience
- Connectez-vous au LHC !
- Inventé au CERN... comme tant d'autres choses
- Catastrophes naturelles : le CERN aide à cartographier les zones sinistrées
- Une joyeuse célébration
- Prenez-le à cœur
- L'antimatière à l'école
- Lancement du nouveau CERN Admin e-guide
- A la rencontre des « vrais » physiciens
- Emportez la bibliothèque avec vous
- Concours de photos 2010
- Pavol Földes (1986-2010)
- Déclaration fiscale : attestation pour les membres du personnel et des pensionnés résidant en France
- BRAVO !!! Vous avez été formidables !

INVENTÉ AU CERN... COMME TANT D'AUTRES CHOSES

Le CERN a souvent servi d'incubateur au développement de technologies innovantes, mais très peu de gens savent que les écrans tactiles capacitifs ont été inventés en 1973 pour les consoles de la salle de contrôle du SPS. Le Bulletin a interviewé leur inventeur, Bent Stumpe, qui a également mis au point pour le CERN une boule de commande et une manette de contrôle programmable.

Un but précis, beaucoup de motivation et les compétences techniques pour réaliser le projet : voilà tout ce dont vous avez besoin pour créer quelque chose de totalement nouveau. Dans les années 1970, alors que le SPS était en cours de construction, il fallait prévoir pour sa salle de contrôle l'installation de milliers de boutons, de manettes, d'interrupteurs et d'oscilloscopes pour faire fonctionner la machine. Frank Beck, récemment recruté de la division DD pour prendre en charge le poste de contrôle central

Member of SCNAT

Swiss Institute of Particle Physics (CHIPP)

CHIPP is an association uniting researchers active in particle, astroparticle and nuclear physics in Switzerland. It strengthens the Swiss participation in international projects and committees, coordinates research and teaching activities in Switzerland, and promotes public awareness of the field. more

Image: ESO

Organisation + Members & Institutes Meetings & Documentation + Activities & Calendar +

› Swiss Institute of Particle Physics

13.3.2018 | Press release | News

Drugs from the particle physics research lab

CERN-MEDICIS manufactures isotopes for medical purposes

Sender
CHIPP

Swiss Institute of Particle Physics

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Image: ESO

Organisation + Members & Institutes Meetings & Documentation + Activities & Calendar +

› Swiss Institute of Particle Physics

15.2.2017 | News

Research as a peace project

SESAME synchrotron in Jordan ready to start

Sender
CHIPP

Swiss Institute of Particle Physics

The laws of particle physics apply regardless of place and time, but the laws can't be explored or their applications studied equally well in any location. Particularly in poorer countries, cost-intensive research projects face big challenges. Against this background, there is a ray of hope that the first Synchrotron in the Middle East for the production of