

IPPOG Resource Database

Proposed new resources / contributions

While the new IPPOG website including new RDB is under development, from August 2020 the IPPOG Resource Database (RDB) **website will become temporarily static - it will not be possible to submit new resources**. Therefore we will ask our contributors to wait and come back with their materials when the new IPPOG RDB is published (in 2021).

There exist many resources out there which fit to IPPOG RDB perfectly, but have not been uploaded. We aim for new RDB to become as comprehensive and representative collection of PP outreach and education resources as possible. Please, contribute below with the ideas of such materials.

New resource title	Link (if exists)	Author	Proposed By	Details
Subway Hangout (the cavern of the CMS experiment)	http://www.youtube.com/watch?v=De-ndczK_SU	CIEMAT: Jesús Puerta Pelayo, IFCA: Rocío Vilar Cortabitarte / Jónatan Piedra Gómez, Universidad de Oviedo: Bárbara Álvarez González	Alberto Ruiz Jimeno	Video with the visit to the cavern of the CMS experiment (in spanish)
GREAT CHALLENGES OF KNOWLEDGE / II CIEMAT Science Week Conference	https://www.youtube.com/watch?v=4gJIEdzattQ&list=PL9QNJfVQHfIEhaQolrnPrLqiCgUvrre2M&index=3	J. Puerta Pelayo CIEMAT	Alberto Ruiz Jimeno	Video (in spanish) Science Week Conference
The dawn of neutrino astronomy	https://cienciayelcosmosdelsigloxxi.blogspot.com/	José Ignacio Crespo Anadón	Alberto Ruiz Jimeno	Chapter in e-book (in Spanish) celebrating the 40th anniversary

				of Carl Sagan's Cosmos. Published under Creative Commons license (CC BY-NC-SA 4.0).
Discover the Z and Higgs bosons	http://inspiringscience.rdea.gr/delivery/view/index.html?id=270c02e179f742a7a19c0dfef74d52b0&t=p	IASA	Christine Kourkouvelis	This exercise introduces students to CERN, LHC and ATLAS. It gives instructions on how to use the HYPATIA event display to analyze data from ATLAS, specifically Z and Higgs boson decays.
ATLAS Magnetic Field	http://inspiringscience.rdea.gr/delivery/view/index.html?id=1e0e531b7ab348f98288b0b6ef9c565a&t=p	IASA	Christine Kourkouvelis	Students are introduced to how a magnetic field is generated, the Lorentz force, etc. A web application is used to show how various particles behave in different magnetic fields depending on their speed, field intensity, orientation etc.
How to Accelerate particles	http://inspiringscience.rdea.gr/delivery/view/index.html?id=4ca172fdcf1b4609b2a637f35ede83a6&t=p	IASA	Christine Kourkouvelis	This exercise is an introduction to particle accelerators and high energy physics. The students play a game in which they have to apply what they've

				learned in a 'virtual accelerator'.
Study data from the LHC	http://inspiringscience.rdea.gr/delivery/view/index.html?id=9dbc01856adb4f50b84a5fa864502507&t=p	IASA	Christine Kourkouvelis	This exercise explains the basics of the standard model of particle physics and particle collisions. It explains what muons are and how their angles can be measured through the use of the HYPATIA event display or the CMS iSpy.
Study Cosmic Rays	http://inspiringscience.rdea.gr/delivery/view/index.html?id=228690c20d7141fc9ecfe69221302584&t=p	IASA	Christine Kourkouvelis	This scenario explains what cosmic rays are and how they interact with the earth's atmosphere. It explains how time dilation works and how the students can use real data from cosmic ray detectors installed at schools all over the world to make their own plots of muon lifetime.
Search for Long Lived Particles in ATLAS	https://www.zoonyer.org/projects/mrniaboc/reinforce-wp5	IASA	Christine Kourkouvelis	Help the ATLAS scientists look for signatures of new massive long-lived particles produced in proton-proton collisions, which could be a sign of New Physics.
All that MATTERs	http://inspiringscience	IASA	Christine	The goal of this

	ence.rdea.gr/delivery/view/index.html?id=02afe7b3264f4848bf59c42a6b07e3cf&t=p		Kourkoulis	demonstrator is to teach students the fundamental particles that make up our world.. Students will be asked to form some of the atoms that we find in nature.
Conservation of momentum in particle collisions	https://cloud.graasp.eu/en/pages/547312344c09ae2e5491328e/auth:pwd=false	IASA	Christine Kourkoulis	Students will determine the total momentum from all particles tracked after a particle collision and they will calculate the missing momentum(magnitude & direction).
« The Higgs Discovery Explained »	https://youtu.be/so2nCu2Jkbc	Piotr Traczyk	Barbora Bruant Gulejova	2 episodes already published, a third one should come
Discover CERN online	discover CERN online	CERN, Francois Briard	Barbora Bruant Gulejova	Used during COVID period, link doesn't work anymore... but nice resource...
Virtual Conferences about CERN	https://home.cern/news/news/cern/virtual-lectures-schools	CERN, Francois Briard	Barbora Bruant Gulejova	Used during COVID period...
International HST programme - lectures	https://teacher-programmes.web.cern.ch/international-high-school-teacher-programme	Jeff Wiener et al.	Barbora Bruant Gulejova	
Canadian website with	https://resources.perimeterinstitute		Barbora Bruant	

resources on modern physics for teachers	ca/		Gulejova, Soleiman Rasouli	
Physics for the IB diploma - 6th edition	http://93.174.95.29/main/3020F410638982A8F68FC7513072FC28	K. A. Tsokos, Peter Hoeben, Mark Headlee	Barbora Braunt Gulejova , Soleiman Rasouli	Chapter 7.3.
Physics for the IB diploma - 2nd edition	http://93.174.95.29/main/3020F410638982A8F68FC7513072FC28	John Allun	Barbora Bruant Gulejova , Soleiman Rasouli	Chapter 7.3.
Physics, 2014 edition, IB diploma programme	http://93.174.95.29/main/262B457615B2B3420277AE52913C22E8	Michael Bowen-Jones, David Homer	Barbora Bruant Gulejova+ Soleiman Rasouli	Chapter 7
The Particle Adventure	http://particleadventure.org/index.html		Barbora Bruant Gulejova	
Erarbeitung von Schulmaterialien für die 10. Jahrgangsstufe über Zusammenhang physikalischer Grundlagenforschung mit anderen Forschungsgebieten (z.B. Kosmologie) und alltäglichen Anwendungen (z.B. Detektoren für die Medizintechnik), Thesis for the	http://www.physik.uni-bonn.de/outline/temp_schule_schulmaterialien.htm	A. Petri	Barbora Bruant Gulejova	Broken link Michael Kobel could help

first student teacher exam, Bonn University, June 200				
D.Schmitz, Konzeption und Erstellung von interaktivem multimedialem Lernmaterial iiberAtom-, Kern- und Teilchenphysik fur die Sekundarstufe I, Thesis for the first student teacher exam, Bonn University, June 200	http://www.physik.uni-bonn.de/outr each/temp_schule_schulmaterialien.htm	A.Petri	Barbora Bruant Gulejova	Broken link Michael Kobel could help
EPPSU Final Document	https://europeans trategy.cern/	CERN Council	Steven Goldfarb	Information concerning our hopes for the future of our field, as well as the process used to come up with the plans
ICHEP2020 Closing Talk	https://indico.cern.ch/event/868940/contributions/3905722/attachments/2085391/3503363/ICHEP-Summary-final.pdf	Paris Sphicas	Pedro Abreu	Contains lots of information for scientists to prepare public talks
Science in school website	https://www.scienc einschool.org/		Barbora Bruant Gulejova	
Videos from ICHEP2020 for the general public	https://www.youtu be.com/playlist?li st=PL84vud1rNM VQ-c3YKmTFZyh		Barbora Bruant Gulejova , Vojtech	

	vDZpcl-ykX		Pleskot	
PP for high school students materials		Jeff Wiener , Julia Woithe	Barbora Bruant Gulejova	
The quantum prisoner	https://quantum-prisoner.com/	CEA Céline Lipari Julien Arlot	Philippe Briet	http://irfu.cea.fr/Phocea/Page/index.php?id=928
Dark matter experiment with lense bending effect - jelly	(67) Jelly lensing hands-on activity by Julia Woithe CERN Education Lab - YouTube	Julia Woithe	Barbora Bruant Gulejova , Julia Woithe	
A quantum thought experiment	https://youtu.be/QkZCPMVgR4g	Matteo Fadel	Barbora Bruant Gulejova , Steven Goldfarb	
Symmetry magazine - many things, e.g. teachers related	High school teachers, meet particle physics symmetry magazine		Barbora Bruant Gulejova , Pedro Abreu	
Beamline for Schools	https://beamlinefor-schools.cern/	CERN and DESY	Margherita Boselli	Physics competition for high-school students. First prize: 2 weeks of beamtime.
A Day with Particles	https://youtu.be/e0Lv2GrsXig	Science to Go and Connie Potter	Vojtech Pleskot	A short film about one day in the life of a particle physicist.
How to make your own cloud chamber	https://home.cern/news/news/experiments/how-make-your-own-cloud-chamber	Sophie Hetherton	Kevin Mosedale	I've said NO to a couple of other cloud chamber links on the current RDB. This could

				replace them.
New S'Cool LAB classroom activities	https://scoollab.web.cern.ch/classroom-activities	S'Cool LAB team / Julia Woithe	Julia Woithe	Some of the resources there are already in the current DB, but there are also a few new resources about DIY projects for the classroom like a LINAC model, a DIY photodiode particles detector, or a laser lab

Physics and Arts	https://www.facebook.com/mitchsummers/videos/1310008182716203	Michael Grab	Boyka Aneva	
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Proton-man	Proton Man - NAPT (proton-therapy.org)	Pedro Abreu	Barbora	Comics for kids, about proton therapy of cancer
B anomalies How particle physics works I	https://www.youtube.com/watch?v=9dLyTS0Xscw	Barbara Gallavotti	Katharina Mueller	<i>Theoreticians and experimental physicists are closely collaborating to find out if the anomalies observed by the experiment LHCb can be confirmed, and in case how this would change the Standard Model.</i>
B anomalies How particle physics works II	https://www.youtube.com/watch?v=krWPeFLLBFY	Barbara Gallavotti	Katharina Mueller	<i>Follow-up video about new results released in Spring 2019.</i>
Hints of a New Microscopic Force	https://www.youtube.com/watch?v=sX6g9hgpxXo	Barbara Gallavotti	Katharina Mueller	<i>Interview with Gino Isidori (Theory, Zurich)</i>
How Particle Physics Works: Episode III - The Anomalies Strike Back	https://www.youtube.com/watch?v=COXu8ntdTFU	Barbara Gallavotti	Katharina Mueller	<i>Discussion on the new result from LHCb hinting to lepton flavour violation</i>
CERN's Women in Technology Outreach Material	Outreach	Hannah Short, Maria Alandes Pradillo, Ellen Milne	wit-outreach@cern.ch	<i>Some downloadable material around programming and physics, aimed at women and girls. Also pointers to</i>

				<i>external resources.</i>
Developing the Standard model	<i>ICTS Outreach program</i> https://www.youtube.com/watch?v=XKqdAF0ebxA	Dr. Sreerup Roychoudhury		<i>Story of the development of the standard model.,</i>
Work like astroparticle physicists with Cosmic@Web	<i>cosmicatweb.desy.de</i>	Carolin Schwerdt	Carolin Schwerdt	<i>Online Analysis Tools for the Investigation of Cosmic Particles</i>
Cosmic Particles	<i>cosmic.desy.de</i>	Carolin Schwerdt	Carolin Schwerdt	<i>online learning resource about cosmic particles</i>
The Films and Proposals of participants in BL4S competition	https://beamlinefor.schools.cern/bl4s-competition/winners	Margherita Boselli	Soleiman Rasouli	<i>There are more than 200 films produced (optional in 2021) and proposals, 20 short list and 10 mention list and 2 winner teams per year. Some of novel ideas can be improved and become a resource</i>
App Quantum 3	https://www.youtube.com/watch?v=XsSOvHgcZww	Project supported by the US National Science Foundation under grant PHY 1653405 See the YouTube video	Stefania Della Sciucca	<i>Quantum 3 is an educational match-3 game for all ages where fun meets quantum physics, building subatomic particles. It is a free App for iOS and Android</i>
App Cosmic Rays Live	https://web.infn.it/OCRA/misura-della-rate-di-muoni-cosmici/	The "Cosmic Rays Live" App, downloadable	Stefania Della Sciucca	<i>With an Android or iOS system, the data is</i>

		from any smartphone, was developed at the Gran Sasso Laboratories, in collaboration with industry professionals, on which entire sets of data collected by the CRC can be saved.		automatically saved on the mobile phone whenever you connect to one of the sites where the telescopes are located (Gran Sasso National Laboratories, Canfranc Underground Laboratory in Spain, New York University in Abu Dhabi and Monte Soratte).
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Charged Particle Accelerators: From Rutherford's Experiments to the Large Hadron Collider	https://postnauka.ru/longreads/156125	Igor Meshkov	Yuriy Ivanov	Lecture on the history of particle accelerators (in russian).
Large Hadron Collider	https://elementy.ru/LHC	Igor Ivanov	Yuriy Ivanov	Popular science encyclopedia on the Large Hadron Collider and particle physics (in russian).
One Hundred Years of Particle Physics	https://www.youtube.com/watch?v=1fXFESV1VUM	Dmitiy Gorbunov	Yuriy Ivanov	Popular science lecture for schoolchildren on the physics of elementary particles (in russian).

Distributed Electronic Cosmic-ray Observatory	https://wipac.wisc.edu/deco	Justin Vandenbroucke	Yuriy Ivanov	Cosmic ray research project using smartphones.
Open Education at JINR	https://edu.jinr.ru/	JINR	Yuriy Ivanov	Educational portal of the Joint Institute for Nuclear Research.
Physics High	https://www.youtube.com/c/PhysicsHigh/featured	Paul Looyen	Yuriy Ivanov	YouTube channel with short videos on physics for teachers and schoolchildren, including about CERN and elementary particles.
Particle Physics Playground	http://particle-physics-playground.github.io/#	Matt Bellis et al.	Yuriy Ivanov	The website allows you to learn how to process particle physics data from the LHC.
Cartoon about space (eng)	https://www.youtube.com/watch?v=kTDnz2iLd7E&list=PLbsqUzxZlcP4fqbKh2Lcxk7bmAewuqdo5&index=8	INFN	Cecilia Collà Ruvolo	
Cartoon about matter (eng)	https://www.youtube.com/watch?v=NQSR1zmtlVg&list=PLbsqUzxZlcP4fqbKh2Lc	INFN	Cecilia Collà Ruvolo	

	xk7bmAewugdo5&index=9			
Cartoon about gravity (eng)	https://www.youtube.com/watch?v=b0QiEoVcyU4&list=PLbsqUzxZlcP4fgbKh2Lcxk7bmAewugdo5&index=10	INFN	Cecilia Collà Ruvolo	
Playlist of interviews about Gravitational Waves	https://www.youtube.com/playlist?list=PLbsqUzxZlcP7oL-LK2es61vaSrFkbbKM	INFN	Cecilia Collà Ruvolo	Barry Barish, Kip Thorne, Rainer Weiss (eng sub ita)
Playlist of short interviews to Roger Penrose	https://www.youtube.com/playlist?list=PLbsqUzxZlcP59LsZxvAQvTDDIgKGoZJKd	INFN	Cecilia Collà Ruvolo	Roger Penrose (answer eng sub ita , questions ita)
Video about Gravitational Waves (ita sub eng)	https://www.youtube.com/watch?v=EqDmOYkNYwc&list=PLbsqUzxZlcP4g5Ax0blhAxiHGB6FBjPKV&index=7	INFN	Cecilia Collà Ruvolo	
Comics about Gravitational Waves (ita)	https://www.asimmetrie.it/images/26/pdf/fumetto_allegato_AS26.pdf	INFN	Cecilia Collà Ruvolo	

An Italian history of innovation	Not available (only pdf and video)	INFN	Cecilia Collà Ruvolo	Texts and video from the exhibition “An Italian history of innovation”
La natura si fa in 4: INTERACTIONS	https://home.infn.it/images/mostre/quattroforze/scheda0.pdf	INFNQ2	Cecilia Collà Ruvolo	Sheet for students produced for the exhibition “La natura si fa in 4” (link to the italian version). Also other languages are available: English, Spanish, French and German)
La natura si fa in 4: ELECTRIC CHARGES AND MAGNETS	https://home.infn.it/images/mostre/quattroforze/scheda1.pdf	INFN	Cecilia Collà Ruvolo	Sheet for students produced for the exhibition “La natura si fa in 4” (link to the italian version). Also other languages are available: English, Spanish, French and German
La natura si fa in 4: ELECTRIC CURRENT AND	https://home.infn.it/images/mostre/quattroforze/scheda2.pdf	INFN	Cecilia Collà Ruvolo	Sheet for students produced for the exhibition “La natura si fa in 4”

WAVES				(link to the italian version). Also other languages are available: English, Spanish, French and German
La natura si fa in 4: ACCELERATORS	https://home.infn.it/images/mostre/quattroforze/scheda3.pdf	INFN	Cecilia Collà Ruvolo	Sheet for students produced for the exhibition “La natura si fa in 4” (link to the italian version). Also other languages are available: English, Spanish, French and German
La natura si fa in 4: ATOMS	https://home.infn.it/images/mostre/quattroforze/scheda4.pdf	INFN	Cecilia Collà Ruvolo	Sheet for students produced for the exhibition “La natura si fa in 4” (link to the italian version.). Also other languages are available: English, Spanish, French and German

La natura si fa in 4: NUCLEI, QUARKS AND GLUONS	https://home.infn.it/images/mostre/quattroforze/scheda5.pdf	INFN	Cecilia Collà Ruvolo	Sheet for students produced for the exhibition “La natura si fa in 4” (link to the italian version). Also other languages are available: English, Spanish, French and German
La natura si fa in 4: RADIOACTIVITY AND THE WEAK FORCE	https://home.infn.it/images/mostre/quattroforze/scheda6.pdf	INFN	Cecilia Collà Ruvolo	Sheet for students produced for the exhibition “La natura si fa in 4” (link to the italian version). Also other languages are available: English, Spanish, French and German
La natura si fa in 4: NEUTRINOS AND THE SUN	https://home.infn.it/images/mostre/quattroforze/scheda7.pdf	INFN	Cecilia Collà Ruvolo	Sheet for students produced for the exhibition “La natura si fa in 4” (link to the italian version). Also other languages are available: English, Spanish,

				French and German
La natura si fa in 4: GRAVITY	https://home.inf.n.it/images/mostre/quattroforze/scheda8.pdf	INFN	Cecilia Collà Ruvolo	Sheet for students produced for the exhibition “La natura si fa in 4” (link to the italian version). Also other languages are available: English, Spanish, French and German
La natura si fa in 4: THE THEORY OF EVERYTHING	https://home.inf.n.it/images/mostre/quattroforze/scheda9.pdf	INFN	Cecilia Collà Ruvolo	Sheet for students produced for the exhibition “La natura si fa in 4” (link to the italian version). Also other languages are available: English, Spanish, French and German
Multimedia installations	https://home.inf.n.it/it/comunicazione/mostre-e-installazioni/installazioni-multimediali	INFN	Cecilia Collà Ruvolo	Link to the webpage where all the INFN artistic installations are stored (suitable for exhibitions)

PARTICLE JUKEBOX	https://www.youtube.com/playlist?list=PLbsqUzxZlcP5rD8L_gxKQ02_Pttc5uoHZ	INFN	Cecilia Collà Ruvolo	Playlist of lectures for high school students about the history of Physics (ita)
PARTICLE LAND	https://www.youtube.com/playlist?list=PLbsqUzxZlcP70GJz7B87GHJs2zdxMHnBG	INFN	Cecilia Collà Ruvolo	Playlist of lectures for high school students about current research in particle physics at INFN (ita)
ASIMMETRIE, INFN magazine	https://www.asimmetrie.it/	Asimmetrie INFN	Cecilia Collà Ruvolo	INFN magazine (ita). Infographics at high-res are available at https://www.asimmetrie.it/infografiche
ASIMMETRIE n°18: New Physics	https://www.asimmetrie.it/images/pdf/asimmetrie_18_eng.pdf	Asimmetrie INFN	Cecilia Collà Ruvolo	Special issue of Asimmetrie (eng)
ScienzaPerTutti A SCUOLA CON VOI	https://scienzapertutti.infn.it/attivita-per-le-scuole/a-scuola-con-voi	ScienzaPerTutti INFN	Cecilia Collà Ruvolo	A variety of material for high school students grouped by topic (ita)
Perimeter resources	link to Perimeter Resources: https://resources.perimeterinstitute.ca/	Damian Pope from Perimeter	Barbora Bruant Gulejova	Cool resources fitted to school curriculum- Canada

Quantum Prisoner	The Quantum Prisoner (prisonnier-quantique.fr)	Julien Arlot, Celine Lipari...	Barbora Bruant Gulejova	Video game
Summer Webinar Series in physics TIGER in STEMM	TIGERSTEMM - Summer Webinar Series in Physics (tigerinstemm.org)	Clara Nellist	Barbora Bruant Gulejova	Series of webinars
The augmented reality particle accelerator	http://www.acceleratar.uk	Dr Chris Edmonds (University of Liverpool) et al.	Stefania Della Sciucca	Build up your own accelerator and by placing the cubes on a tabletop and then bring it to life using the acceleratAR app.
Magnetic Force and Particle Physics	http://polilabhome.polito.it/en/2020/10/23/magnetic-force-and-particle-physics/	Politecnico di Torino	Lorenzo Galante	Evaluating the particle momentum from the curvature radius of its track (Experimental activity based on a Real collision event between a pion and an Helium nucleus)

Bubble chambre workshop teachers resource	https://indico.cern.ch/event/318730/contributions/737354/attachments/613359/843829/Bubble_Chamber_Workshop_Teacher_Resource.pdf		Barbora Bruant Gulejova , Federico Leo Redi	Helpful explanations for teachers showing how to extract momentum from particles track, how planck's uncertainty can be seen? et...
Track inspection how to spot subatomic particles	https://www.scienceinschool.org/content/track-inspection-how-spot-subatomic-particles		Barbora Bruant Gulejova , Jeff Wiener	Article related to resource below
Taming the Particle Zoo	https://resources.perimeterinstitute.ca/products/taming-the-particle-zoo?	Perimeter Institute	Michael Gregory	Card sorting activity to discover symmetries and predict omega minus
Scattering Experiment	https://resources.perimeterinstitute.ca/products/scattering-experiment-rutherford-scattering	Perimeter Institute	Michael Gregory	Modelling Rutherford experiment with household items (wine glass, marbles, etc.)
Process of Science	https://resources.perimeterinstitute.ca/products/the-process-of-science	Perimeter Institute	Michael Gregory	Series of activities to model scientific method, observation, hypothesis

Radioactive Decay Model	https://www.exploratorium.edu/snacks/radioactive-decay-model	Exploratorium Teacher Institute	Michael Gregory	Modelling radioactive decay with coins
Measuring Nuclear Size with a pen and pencil	https://fisicademos.blogs.uv.es/files/2018/10/demo150.pdf	Universidad de Valencia - Demostraciones Fisica por el Aula	Michael Gregory	Rutherford scattering model dropping pencil onto circles (also models Monte Carlo method)
Particle Physics for Kids - Virtual Science Camps	https://tinyurl.com/PPK-Playlist	Michael Gregory	Michael Gregory	Free online lectures and hands-on sessions to introduce kids to particle physics
Radioactive decay simulation	https://fisicademos.blogs.uv.es/files/2016/05/demo76.pdf	Ana Cros	Alberto Ruiz Jimeno	To show the probabilistic nature of radioactive decay by means of an interactive game based on a two-state system. To introduce the physical quantities describing radioactive decay. To verify the law of radioactive decay quantitatively.

Particle Physics: A Very Short Introduction		Frank Close	Seddigheh Rezapour	The book begins with a guide to what matter is made up of and how it evolved, and goes on to describe the fascinating and cutting-edge techniques used to study it. The author discusses particles such as quarks, electrons, and the neutrino, and exotic matter and antimatter. He also investigates the forces of nature, accelerators and detectors, and the intriguing future of particle physics.
Ten things you might not know about antimatter	https://www.symmetrymagazine.org/article/april-2015/ten-things-you-might-not-know-about-anti-matter	Diana Kwon	Seddigheh Rezapour	Antimatter has fueled many a supernatural tale. It's also fascinating all by itself.
The other particle detector	https://www.symmetrymagazine.org/article/the-other-particle-detector	Ali Sundermier	Seddigheh Rezapour	When studying mysterious subatomic particles, researchers use

				a different kind of particle detector to prevent run-of-the-mill dust particles from getting in the way.
<u>Dark matter: The matter we can't see</u>	https://www.youtube.com/watch?v=HneiEA1B8ks	Lesson by James Gillies, animation by TED-Ed	Seddigheh Rezapour	Animation for children
<u>The beginning of the universe, for beginners</u>	https://www.youtube.com/watch?v=DmUiCweDic4	Lesson by Tom Whyntie, animation by Hornet Inc	Seddigheh Rezapour	Animation for children
Introduction to CERN	https://www.youtube.com/watch?v=73Z5EMUTnkI	Sofia Tech Park Bulgaria - youtube channel Presenter: Zornitsa Zaharieva (CERN)	Roumyana Hadjiiska	A popular lecture about CERN and Bulgarian participation. The lecture is given during the IM 2021. Language - Bulgarian
Physics of elementary particles	https://www.youtube.com/watch?v=JnBhmDfknEU	Sofia Tech Park Bulgaria - youtube channel Presented: prof. Leander Litov (University of Sofia)	Roumyana Hadjiiska	Introduction to particle Physics lecture. The lecture is given during IM 2021. Language - Bulgarian

The CMS detector	https://www.youtube.com/watch?v=Jgt1a8L6HHw	Sofia Tech Park Bulgaria - youtube channel Presenter: Plamen Iaydjiev (Bulgarian Academy of Sciences)	Roumyana Hadjiiska	Introduction to detector physics with focus on CMS, presented during the IM 2021. Language - Bulgarian
Cosmos para o Ensino Básico	https://drive.google.com/file/d/1m2m7jOr6lnEHmHygSlkI3FwRpj5t29KQ/view	PROJETO INTERNACIONAL E NACIONAL EM ENSINO DE PARTÍCULAS E ASTROPARTÍCULAS (EPA), from UFRN-Brazil	Marcelo Munhoz	The book brings a language aimed at the young audience with a bit of humor, and super illustrated. The book deals with some mysteries, interesting stories and important concepts for lovers of the universe.
Cosmos para o Ensino Básico - Braille version for the visually impaired	https://drive.google.com/file/d/1P62KLhCmQgnv7SWaSuaZ1IMyQn-FyXte/view?usp=sharing	PROJETO INTERNACIONAL E NACIONAL EM ENSINO DE PARTÍCULAS E ASTROPARTÍCULAS (EPA) from UFRN-Brazil	Marcelo Munhoz	The book brings a language aimed at the young audience with a bit of humor, and super illustrated. The book deals with some mysteries, interesting stories and important concepts for lovers of the universe.

TRAJETÓRIAS DA FÍSICA DE PARTÍCULAS	http://outreach.ictp-saifr.org/particulas/	ICTP-SAIFR, Brazil	Marcelo Munhoz	With the support of interactive tools, audios, videos and images, the material promotes a journey through field research and explores some of the great scientific projects in the area today
SAIFR Divulga!	https://www.youtube.com/saifrdivulga	ICTP-SAIFR, Brazil	Marcelo Munhoz	Youtube channel of outreach from ICTP-SAIFR
Um Texto para Professores do Ensino Médio sobre Partículas Elementares	https://drive.google.com/file/d/1s0-nYMq3jlydC-novpSxTnWVkd7K6kAc/view?usp=sharing	Fernanda Ostermann	Marcelo Munhoz // João Pedro Ghidini	This work is aimed at high school Physics teachers to present, as accessible as possible, particle physics.
Um pôster para ensinar Física de Partículas na escola	https://drive.google.com/file/d/1w1vW76EniJP67Esc4pqzRxGiUSvvnC8W/view?usp=sharing	Fernanda Ostermann	Marcelo Munhoz // João Pedro Ghidini	In this work, the author presents a poster with information about interaction and particles.
O LHC ajudando a entender conceitos de eletrostática no Ensino Médio	https://drive.google.com/file/d/1msxbZdLCT3pmWTNrsx1uAbPgMaWYVXMj/view	Xabier Cid Vidal // Ramón Cid Manzano	Marcelo Munhoz // João Pedro Ghidini	In this work, the authors suggest how it's possible to relate the LHC and electrostatic

	<u>w?usp=sharing</u>			concepts for high school.
O ensino de partículas elementares por meio da leitura de “Alice no País do Quantum”	<u>https://drive.google.com/file/d/1cAeLi7bi2xLT5CYuBF6QMCJ1I93TVmkj/view?usp=sharing</u>	Jaqueline Maria Pereira // Leandro Londero	Marcelo Munhoz // João Pedro Ghidini	In this work, the authors explore how to use a book of science divulgation to teach particle physics in the classroom.
Cosmic Ray in the Classroom	<u>https://iopscience.iop.org/article/10.1088/0031-9120/48/2/238</u>	Vitor de Souza // Marcelo Alves Barros // Edson César Filho // Cristiano Rodrigo Garbelotti // Hebert Alexandre João	Marcelo Munhoz // João Pedro Ghidini	In this paper the authors present an activity involving low-cost materials that allows the reconstruction of the impact point and arrival direction of cosmic ray particles. The activity allows the discussion of different physics concepts.
O conceito de simetria na física e no ensino médio	<u>https://drive.google.com/file/d/1qmlb7nZ8JzFhl23tS-NiUNNaH-XyY5y/view?usp=sharing</u>	Aires Vinícius Correia da Silveira // Marco Antonio Moreira	Marcelo Munhoz // João Pedro Ghidini	This work has four different articles with the aim to present and discuss the symmetry concept with school physics teachers.

Partículas e Interações	https://drive.google.com/file/d/1GYKvVbArMWg_hXBDETU9z6UbYAuBqsXmc/view?usp=sharing	Marco Antonio Moreira	Marcelo Munhoz // João Pedro Ghidini	In this work, the author makes an introduction to particle physics through a conceptual map.
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Spanish Websites

- <https://www.youtube.com/c/IFTMadrid>
Videos from Instituto de Física Teórica, IFT (CSIC-Univ. Autónoma Madrid) (mostly in Spanish)
- <https://www.youtube.com/c/Difusi%C3%B3nIFCA>
Video collection organized by IFCA members (most of them in Spanish)
- <https://ifca.unican.es/en-us/education-and-outreach/teaching-materials>
Educational material for children and general Public from IFCA (CSIC-Univ. Cantabria)
- <https://www.youtube.com/user/quantumfracture>
A nice collection of videos of science in Spanish
- <http://cfp.ciemat.es/ahombrosdegigantes>
Collaborations of Jesús Puerta Pelayo in the popular science programme of Radio Nacional de España "A hombros de Gigantes" (On the shoulders of giants).
- <https://www.i-cpan.es/es/content/divulgaci%C3%B3n>
Outreach web page of the National Center for Particles, Astroparticles and Cosmology (CPAN), in Spanish mostly