

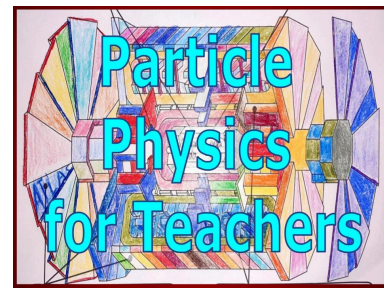
Particle Physics for Teachers - Schedule Nov-Dec 2023

All times are indicated in CET (Paris/Geneva time). Most sessions start at 18:00, except for the ATLAS visit, which starts at 17:00 to fit within ATLAS opening hours.

Most sessions will last approximately an hour, but may run shorter or longer, especially depending on questions and discussions.

Playlist of recorded sessions:

<https://www.youtube.com/playlist?list=PLVBCF3W9tuWqIGz85a6LprAIJFgfE0tzE>



Overview Schedule (see detailed schedule below)

Particle Physics in the classroom and beyond
with Michael Gregory
Tues 21/11 - 18:00

Introduction to Particle Physics and CERN
with Anja Kranjc Horvat (CERN Science Gateway science show manager)
Wed 29/11 - 19:30

ATLAS Detector Visit
with Steve Goldfarb (Canettes Blues Band lead singer)
Fri 1/12 - 17:00

Making the Invisible Visible with Detectors
with Marco Kirschner (teacher, Germany)
Mon 4/12 - 19:30

Perimeter Institute Resources
with Dave Fish (Perimeter Teacher in Residence)
Thurs 7/12 - 18:00

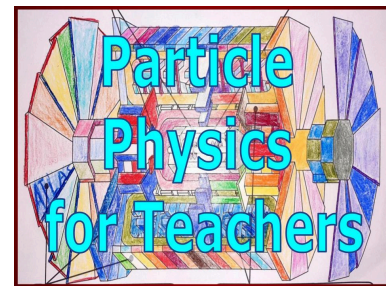
CMS Muon Telescope & History of Gas Detectors
with Jesus Puerta Pelayo (Head of Outreach, CIEMAT, Spain)
Tues 12/12 - 18:00

Homemade Radon Detector
with Federico Andreoletti (teacher and president of Aghi Magnetici, Italy)
Thurs 14/12 - 18:00

CERN Science Gateway Resources
Yiota Chatzidaki, Guillaume Durey, Anastasia Tezari
Mon 18/12 - 18:00

The Triumphant Discovery of the Higgs Boson
with Claire David (AIMS South Africa, York University, FermiLab)
Tues 19/12 - 18:00

PP4T Course Webpage: www.scienceonstage.fr/pp4teachers/
Link to this page: <https://tinyurl.com/pp4t-schedule>
Registration form: <https://forms.gle/k2tzjTHnug662D2k8>



Detailed Schedule

**Introduction to Particle Physics and CERN
with Anja Kranjc Horvat (CERN Science Gateway science
show manager)
Wed 29/11 - 19:30**

Anja Kranjc Horvat is a science communicator and physics education researcher in the field of particle physics education. She finished her PhD in physics education research with University of Potsdam and CERN in 2022, and she's now continuing her work at CERN as a science show developer. While her job focuses on science shows at CERN's new Science Centre, Science Gateway, her research focus remains particle physics education for high-school students and teachers.

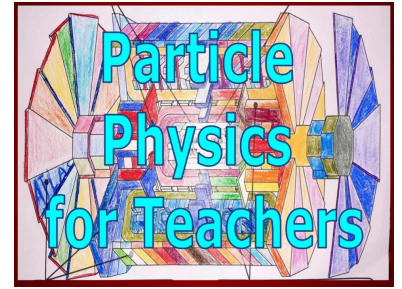
Anja has also been a great mentor to me (Michael Gregory) on a variety of science communication and particle physics education topics. It is both an honour and a great pleasure to have Anja kick off the course with this first session, where she will give a general overview of particle physics and an introduction to CERN.

**Particle Physics in the Classroom and Beyond
with Michael Gregory
Thurs 23/11 - 18:00**

Michael Gregory is the host and creator of this "Particle Physics for Teachers" course. It grew out of Michael's "Particle Physics for Kids" virtual camps. Both are examples of his passion to make challenging science accessible to new audiences.

In this session, I'll go over some of the reasoning and motivation behind the course, what to expect in other sessions, and some examples of how it can relate to classroom practice. I'll also go over a handful of other related projects, including my new science show, "Particle Detectives" which I'm creating for CERN's Science Gateway as a portable, low-cost version of Anja's shows.

ATLAS Detector Visit
Steve Goldfarb (Canettes Blues Band singer, ATLAS,
University of Melbourne)
Fri 1/12 - 17:00



Steven Goldfarb is a French/American particle physicist working for the University of Melbourne on the ATLAS Experiment at CERN. He also coordinates undergraduate programs at CERN for the University of Michigan. Steve has served as ATLAS Muon Software Coordinator, Education & Outreach Coordinator and chair of the International Particle Physics Outreach Group. He is a Fellow of the American Physical Society and currently serves on the US-LHC Users Association Executive Committee. Steve frequently gives public talks on science, discovery and international collaboration, co-wrote a popular TED Ed video "The basics of the Higgs boson" and, most importantly, fronts the world-famous Canettes Blues Band.

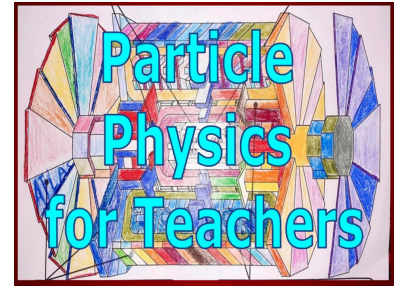
The ATLAS Detector is the largest volume detector ever constructed for a particle collider. ATLAS has the dimensions of a cylinder, 46m long, 25m in diameter, and sits in a cavern 100m below ground. The ATLAS detector weighs 7,000 tonnes, similar to the weight of the Eiffel Tower. For more information on the ATLAS Detector, please see their website: <https://atlas.cern/discover/detector>.

Making the Invisible Visible with Detectors
with Marco Kirschner (teacher, Germany)
Mon 4/12 - 19:30

Marco Kirschner is a teacher at a German Gymnasium, teaching physics, math in grades 5-12 and informatics in grades 5 and 6. He has a gang to particle physics but also likes experimenting with stuff everyone has at home.

Have you ever seen the invisible? Maybe no one ever has, but nowadays scientists are able to make observations on a scale which is invisible for human eyes. Therefore they use large machines - particle detectors. Today's virtual science camp covers questions like "how small can things be", "how can small things and processes on such small scales be observed", "what is the key idea behind particle detectors". Furthermore the participants will have a closer look at the bubble chamber and will work on original material produced by a bubble chamber at CERN.

**Perimeter Institute Resources
with Dave Fish (Perimeter Teacher in Residence)
Thurs 7/12 - 18:00**



Dave Fish has been a high school Physics teacher for 25+ years. His involvement with Perimeter Institute dates right back to the beginning with the initial development of ISSYP, EinsteinPlus and several other outreach activities. He has played a leading role in the production of most of the Perimeter classroom resources. He has given workshops on modern physics at local, provincial, national and international levels. Dave is currently a Teacher in Residence at Perimeter Institute. In his spare time he enjoys reading, travelling, sports and spending time with his wife and three children.

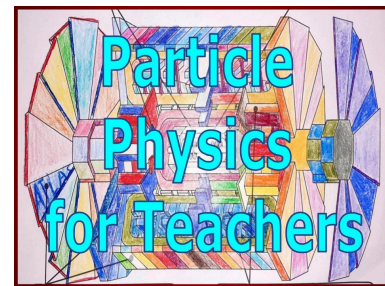
Perimeter Institute is a leading centre for scientific research, training, and educational outreach in foundational theoretical physics. Located in Waterloo, Ontario, Canada, its mission is to advance our understanding of the universe at the most fundamental level, stimulating the breakthroughs that could transform our future. Perimeter also trains the next generation of physicists through innovative programs, and shares the excitement and wonder of science with students, teachers and the general public.

**CMS Muon Telescope & History of Gas Detectors
with Jesus Puerta Pelayo (Head of Outreach, CIEMAT, Spain)
Tues 12/12 - 18:00**

Jesus Puerta Pelayo is a Doctor in Experimental Particle Physics from the Autonomous University of Madrid and a researcher at the CIEMAT-Particle Physics Unit in Madrid. Since 2000 he has been a member of the CMS (Compact Muon Solenoid) experimental collaboration at CERN's LHC (Large Hadron Collider), one of the two experiments responsible for the discovery of the Higgs Boson in 2012. Jesús participated in the design, construction, installation and commissioning of the CMS central muon detector between 2000 and 2008. Since then he has been part of the research team responsible for the operation and scientific exploitation of CMS. He is also a member since 2008 of the CALICE collaboration dedicated to the design of calorimeters for future collider experiments.

Homemade Radon Detector
with Federico Andrioletti (teacher and president of Aghi
Magnetici, Italy)
Thurs 14/12 - 18:00

Federico Andrioletti is a science teacher, science communicator and founder and president of the association Aghi Magnetici (Magnetic Needles) <http://www.aghimagnetici.it/>, where he runs outreach activities in his region and around the world.



When visiting Federico in July 2023, I felt like a kid in a candystore, seeing all of his great experiments, many of them homemade using inexpensive materials. One immediate favourite was a homemade radon detector using an empty coffee tin and some clever circuitry - I immediately wanted Federico to share this in the course! This session is scheduled immediately following Jesus' session on gas detectors, as this is a homemade example which should be possible to make in your own classroom!

The Triumphant Discovery of the Higgs Boson
with Claire David (AIMS South Africa, York University, FermiLab)
Mon 18/12 - 18:00

Claire David is currently working for the African Institute for Mathematical Sciences (AIMS) South Africa leading the development and delivery of post-graduate artificial intelligence training. She has taught at York University in Canada, and been involved in the ATLAS Experiment at CERN, and the Deep Underground Neutrino Experiment, or DUNE at Fermilab. Claire is the Ambassador for the McDonald Institute (Canadian Astroparticle Physics Research Institute). Last year she completed her six-month journey through eight African countries. Her recent work has taken her to university campuses in South Africa, Senegal, Benin, Togo, Democratic Republic of the Congo, Cameroon, Rwanda and Ghana.

It is a thrill to have Claire join us for the final scientific lecture of the course with her talk on **The Triumphant Discovery of the Higgs Boson**.

CERN Science Gateway Resources
Yiota Chatzidaki, Guillaume Durey, Anastasia Tezari
Wed 20/12 - 18:00

Science Gateway is CERN's new education and outreach centre, where they take visitors on a unique journey building on the physical proximity to CERN, its accelerators, detectors, facilities and people.

Through immersive multimedia exhibits, hands-on lab workshops, science shows, events that blend science and culture, innovation-prototyping workshops and tours of authentic CERN places – all guided by CERN people – visitors of all ages and backgrounds can engage in the discoveries, the science and the technologies of CERN.

They have recently launched a new education resource website, which they will guide us through during the session. We will also learn about the Solvay-Education program and have a tour of their new lab facilities.