



The CEVALE2VE case outreach and diversity

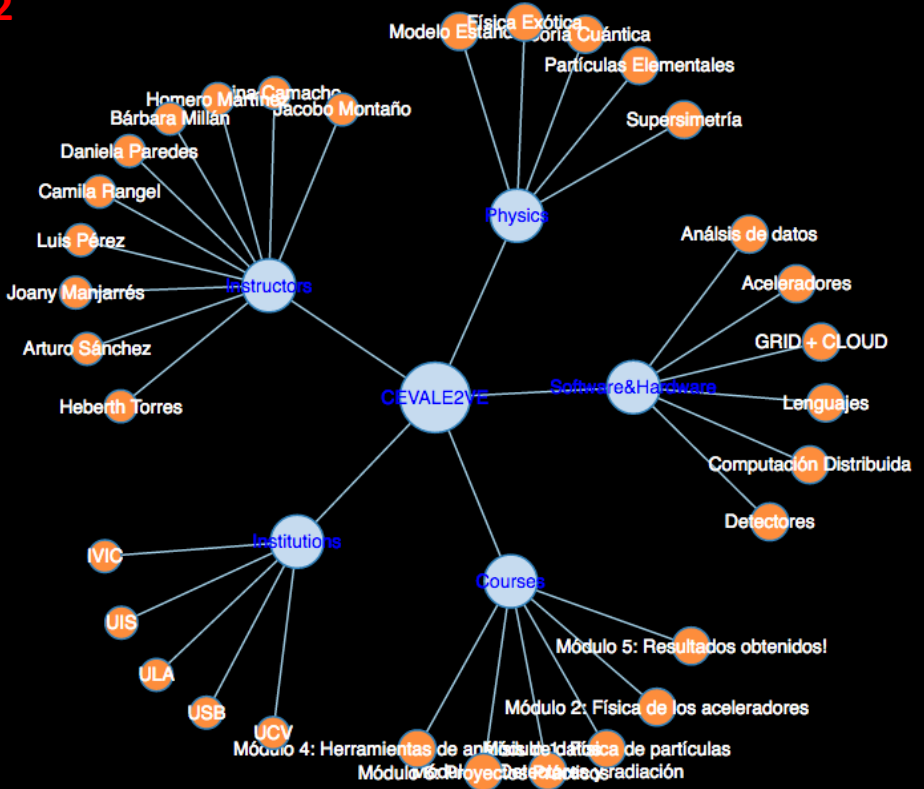


Arturo Sánchez, on behalf the CEVALE2VE team

University of Naples and INFN

ICHEP, August 6th, 2016



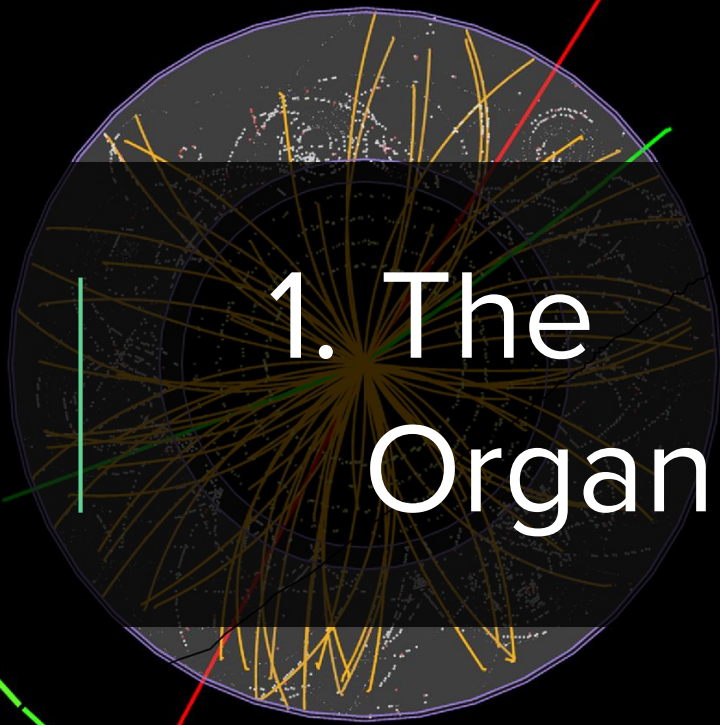


Centro Virtual de Altos Estudios en Altas Energías or Virtual Centre of Studies on High Energy Physics of Venezuela

Outline

- The Organization
 - Vision and Objectives
 - Members
 - Institutions
- Education
 - Postgraduate Course
 - Students supervision
- Outreach
 - Tools
 - Public Lectures & Diplomacy
 - Masterclasses & ATLAS Virtual Visits
- Summary

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1. The Organization

1.1 Vision and Objectives

Education and interest in research: **positively influence and stimulate physics student's interest in HEP research**

Awareness of opportunities: **educate and invigorate the students with further study opportunities in physics and possible career paths in research**

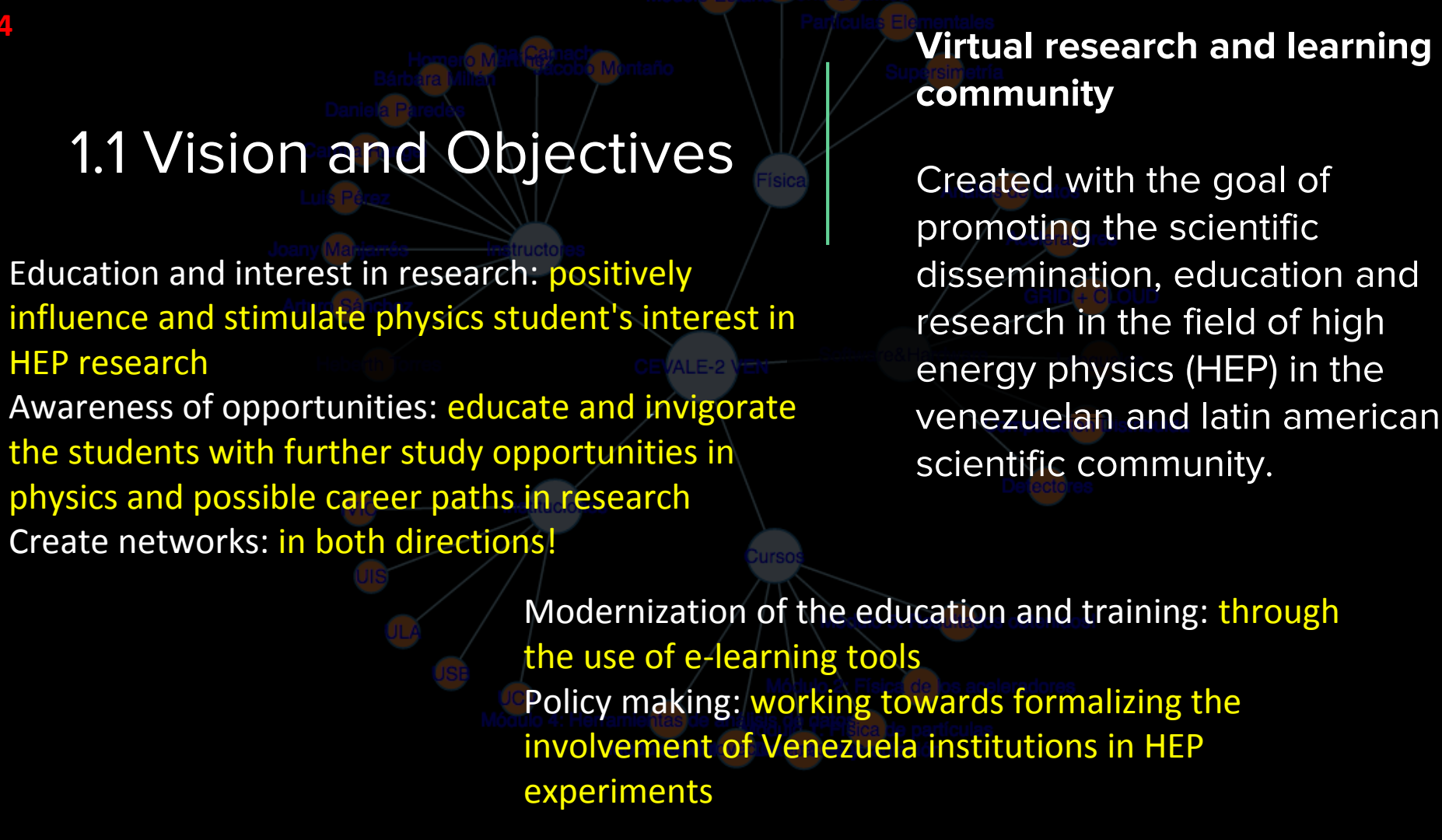
Create networks: **in both directions!**

Modernization of the education and training: **through the use of e-learning tools**

Policy making: **working towards formalizing the involvement of Venezuela institutions in HEP experiments**

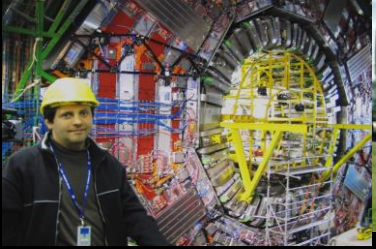
Virtual research and learning community

Created with the goal of promoting the scientific dissemination, education and research in the field of high energy physics (HEP) in the venezuelan and latin american scientific community.



1.2 Members

The community involves **venezuelan researchers working in international collaborations:** HEP experiments detector developments and computing science, developing an academic environment suitable for the steering of the new generations of physicists in Venezuela and other countries of the region.



CEVALE2VE

Institutions

Software&Hardware

GRID + CLOUD

Lenguajes

Computación Distribuida

Detectores

Courses

Módulo 5: Resultados obtenidos!

Módulo 2: Física de los aceleradores

We are 11 Venezuelan working for European and North American universities linked to CERN and other HEP institutions



1.3 Institutions

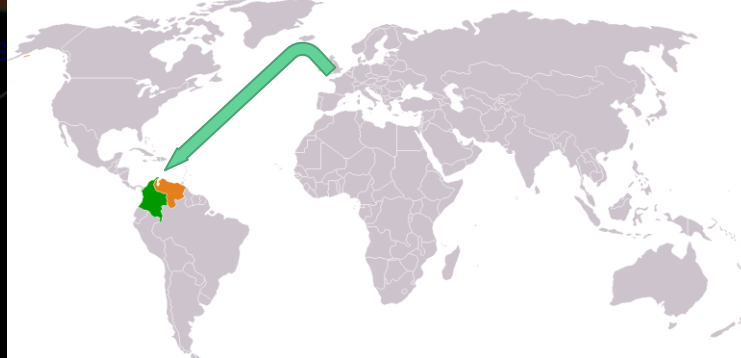


The Institutions

continue

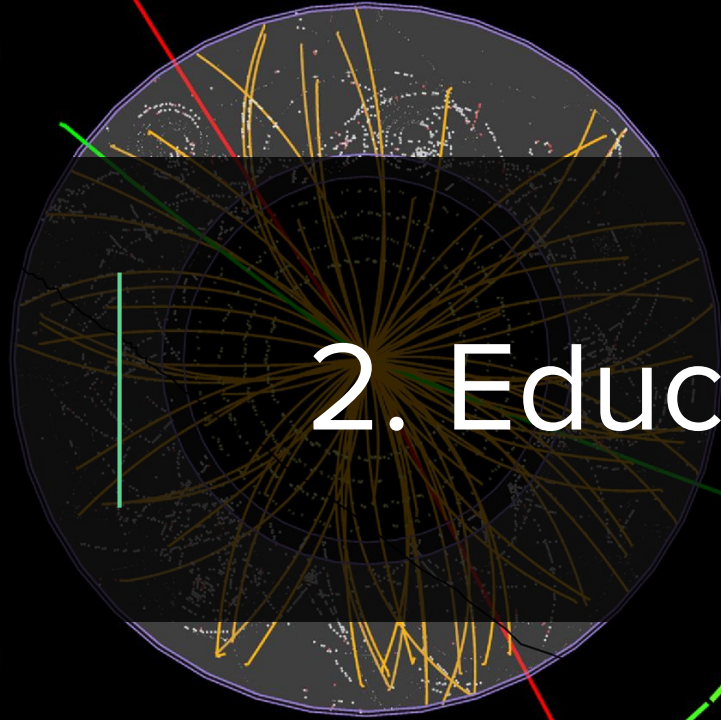
participating

And we all always looking new ways to call the attention of students and professors to be part



- Módulo 2: Física de los aceleradores
- Módulo 4: Herramientas de análisis de datos
- Módulo 5: Física de partículas
- Módulo 6: Proyecto de la Gran Colisión
- Módulo 7: Radiación

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2. Education



2.1 Postgraduate Course I

We developed a course for university students in physics.

- The ideal audience is master and PhD students from the latin american countries.
- The classes are in spanish but the written materials are *-yet-* in english
- The classes were possible using Google hangout and transmitted and recorded in YouTube.
- **The program contains subjects that go from the Standard model, to accelerator and detector technology, data analysis under ROOT and statistics.**

2.4 MeVc ⁻¹ $\frac{2}{3}$ $\frac{1}{2}$ u up	1.27 GeVc ⁻¹ $\frac{2}{3}$ $\frac{1}{2}$ c charm	171.2 GeVc ⁻¹ $\frac{2}{3}$ $\frac{1}{2}$ t top	0 0 1 γ photon
4.8 MeVc ⁻¹ $-\frac{1}{3}$ $\frac{1}{2}$ d down	104 MeVc ⁻¹ $-\frac{1}{3}$ $\frac{1}{2}$ s strange	4.2 GeVc ⁻¹ $-\frac{1}{3}$ $\frac{1}{2}$ b bottom	0 0 1 g gluon
<2.2 eVc ⁻¹ 0 $\frac{1}{2}$ ν_e electron neutrino	<0.17 MeVc ⁻¹ 0 $\frac{1}{2}$ ν_μ muon neutrino	<15.5 MeVc ⁻¹ 0 $\frac{1}{2}$ ν_τ tau neutrino	91.2 GeVc ⁻¹ 0 1 Z⁰ Z boson
0.511 MeVc ⁻¹ -1 $\frac{1}{2}$ e electron	105.7 MeVc ⁻¹ -1 $\frac{1}{2}$ μ muon	1.777 GeVc ⁻¹ -1 $\frac{1}{2}$ τ tau	80.4 GeVc ⁻¹ -1 1 W[±] W boson

The program in Modules:

- Introduction to Standard Model (SM) and physics Beyond the SM
- Accelerator principles
- Particle detector principles
- Introduction to statistics
- Data analysis and computer Tools based in ROOT
- A serie of seminars by invited speakers working in relevant areas of physics

The course has a total duration of 60 hours.

We, the instructors are Europe, so the class starts at 21hrs and for the students is 14hrs and 15hrs depending of the country :)

2.1 Postgraduate Course II

First Post-graduate course completely online

During the second half of 2014 took place the first course “**Introduction to Particle Physics**” for master's and doctoral students.

With 3 venezuelan institutions!

First course took place in the Autumn/Winter 2014 term

The teachers

The godfathers/godmothers

- Include the course in the institute programs
- Discussing/advising on the course content
- Practical issues: rooms, student registration
- See backup

The students

- More than 25 students attended the classes
- 12 accredited students from UCV, IVIC and USB

E-learning tools

- Hang-outs (live transmission youtube)
- Vydio, skype, emails
- Moodle as a learning management system + discussion forums student-student and teacher-student
- Tutorials created by us, e.g. ROOT installation, usage. More info [here](#)

```
[arturos@lpx1us034]~/www/cevale2ve/thesis/samples/test_july_31_2016% root
-----
Welcome to ROOT 6.04/14                                http://root.cern.ch
(c) 1995-2014, The ROOT Team
Built for linuxx8664gcc
From tag v6-04-14, 3 February 2016
Try '.help', '.demo', '.license', '.credits', '.quit'/'!q'
-----
```

root [0] █

Análisis de datos

2.1 Postgraduate Course III

Second Post-graduate course completely online

Just a week ago we close the second edition of the course

“**Introduction to Particle Physics**” for master's and doctoral students.

This time with 4 Colombo-Venezuelan institutions!

Second course took place the Spring/Summer 2016

The teachers

The godfathers/godmothers

- Include the course in the institute programs
- Discussing/advising on the course content
- Practical issues: rooms, student registration
- See backup

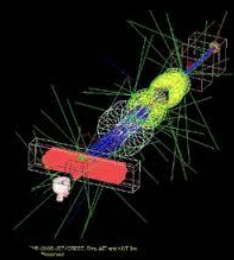
The Students

- More that 30 students attended the classes
- 10 accredited students from UCV, USB and UIS

E-learning tools

- Hang-outs (live transmission youtube)
- Vydio, skype, emails
- Moodle as a learning management system + discussion forums student-student and teacher-student
- Tutorials created by us, e.g. ROOT installation, usage. More info [here](#)

Updated 2016!



CEVALE dos VEN

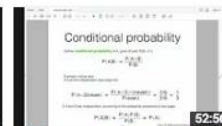
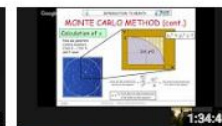
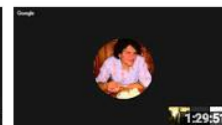
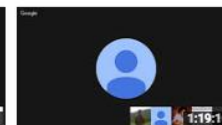
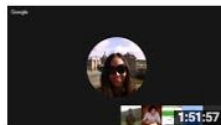
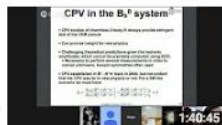
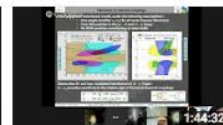
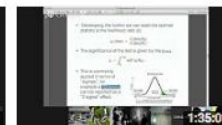
<https://www.youtube.com/channel/UCQFMV mz9Yd48XyHXx6IsTjw>

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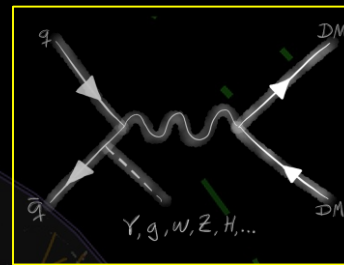
**Big data & procesamiento de datos**
49 views · Streamed 4 weeks ago**Seminario 1: Más allá del Modelo Estándar**
32 views · Streamed 1 month ago**Métodos estadísticos para física de partículas (III)**
15 views · Streamed 1 month ago**Métodos estadísticos para física de partículas (II)**
33 views · Streamed 1 month ago**Métodos estadísticos para física de partículas (I)**
57 views · Streamed 1 month ago**Modulo 2 Clase 8 : GEANT4-Herramienta de simulación de**
60 views · Streamed 2 months ago**Module 2, Lecture 9: Detector examples**
64 views · Streamed 2 months ago**IFP: Introducción a ROOT (2da parte) Arturo Sánchez.**
39 views · Streamed 2 months ago**"PID y trigger" (Módulo 2, clase 7) por Heberth Torres**
29 views · Streamed 2 months ago**Modulo 2 - Clase 4**
68 views · Streamed 2 months ago**IFP Módulo 2, clase 2**
48 views · Streamed 2 months ago**Clase 5: Física más allá del Modelo Estándar**
36 views · Streamed 3 months ago**Clase 1 del Modulo 3 : ROOT**
68 views · Streamed 3 months ago**ATLAS MASTERCLASS FOR VENEZUELA**
53 views · Streamed 4 months ago**Masterclass Venezuela**
36 views · Streamed 4 months ago**Master Class Venezuela 2016: Introducción**
80 views · Streamed 4 months ago**Introducción a la física de partículas: Modulo 5, Seminario 6**
78 views · Streamed 1 year ago**Introducción a la física de partículas: Modulo 5, Seminario 5**
51 views · Streamed 1 year ago**Introducción a la física de****Introducción a la física de****Introducción a la física de****Introducción a la física de****CEVALE2VEN Video SVF****Introducción a la física de**

...producing
>70 hours of
online audio-
visual
content and
~9K view of
our videos...
(dozens of
comments in
the tutorials!)

2.2 Students Supervisions

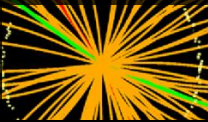
In Physics:

- We have a Master student in physics developing a thesis in the evaluation of a Dark Matter model production in association with heavy quarks in colliders like the LHC.
- She was part of our first session of the course in 2014-2015 and is currently enrolled in the UCV in Venezuela.
- This project is itself a test-field for newer technologies and tools in e-learning and data analysis!
- The plan is to finalize at the end of 2016.



In Languages:

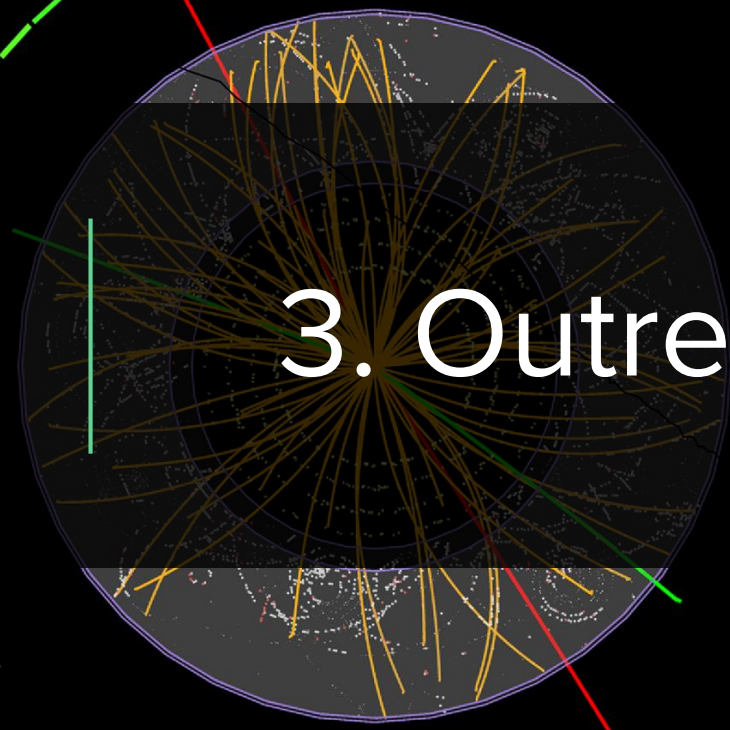
- This has been another beautiful example of the interdisciplinarity that can be involved.
- A university student in Languages was part of our group helping in the translation of all the classes of the first course into Spanish.
- The idea of this project is to have a dual Spanish-English set of classes and slides that allow us to expand the impact of the classes to other students.
- She just got her bachelor's degree a few weeks ago at ULA in Venezuela!



2

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3. Outreach



3.1 Tools

...As part of HEP

collaborations, many of the tools that we use to teach are in synchrony with those used in other outreach projects

(like the CERN OpenData)

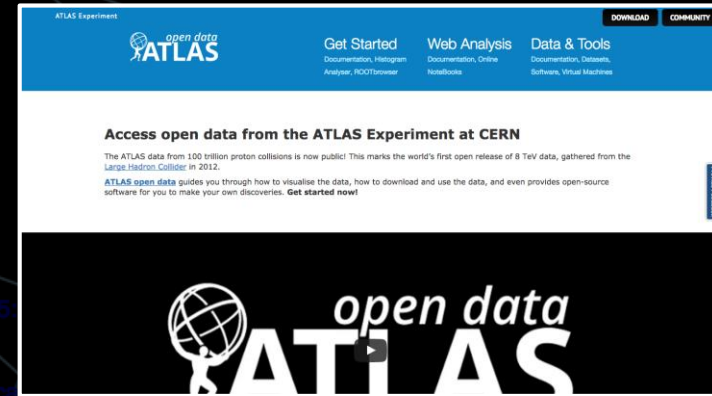
Tools like the software or the techniques. As well in the communication and organizational part



ATLAS Outreach Data & Tools

[CEVALE2VE Outreach Group:](#)
Several ATLAS and not ATLAS physics institutions/members
[link](#)

The recent release of the ATLAS Open Data portal is one of the examples of the constant feedback between the two!



3.2 Masterclasses and ATLAS Virtual Visits

Bárbara Millán
Jacobo Montano
Camila Rangel

The Z-path
di-leptons
di-photons

Actividades de preparación para el ATLAS masterclass

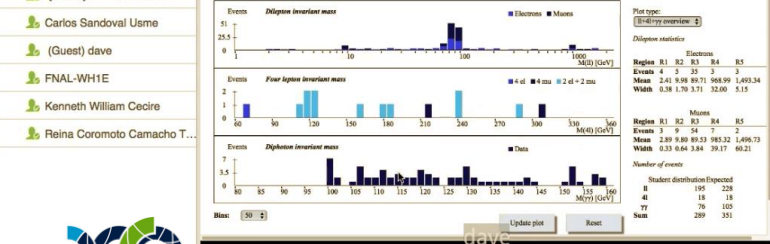
Autor: Carlos Sandoval
Universidad Antonio Nariño

Presentador: Arturo Sanchez P.
Universidad de Napoles "Federico II"

Carlos Sandoval

First time of Venezuela in Masterclasses!

CEVALE2VE



FNAL-WH1E
Carlos Sandoval Usme



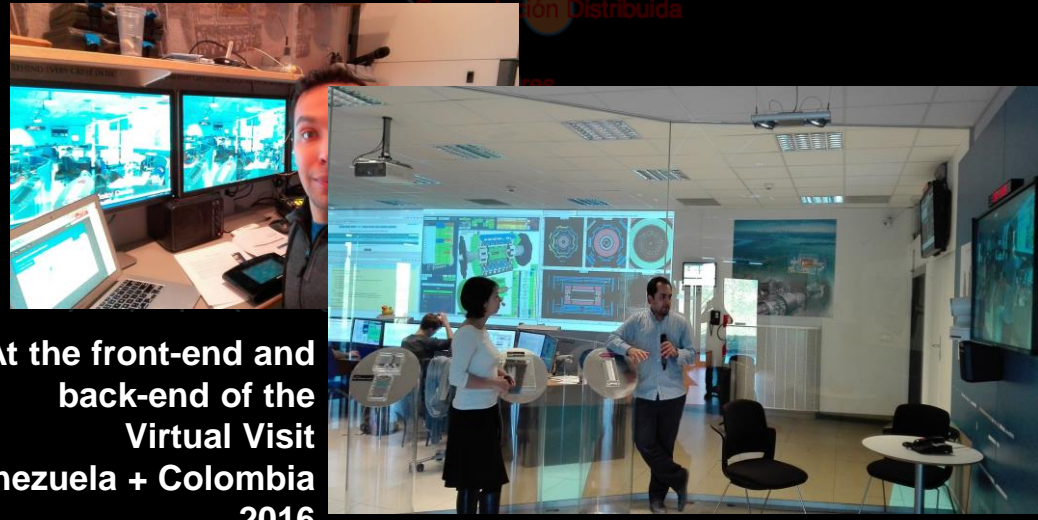
Virtual Center of High Energy Studies, Venezuela-Colombia

Colombia Venezuela

05 June 2014 - 21:00 CET

The Virtual Center of High Energy Studies (Centro Virtual de Altos Estudios en Altas Energías CEVALE2) is a Colombian-Venezuelan initiative to promote the research on particle physics in the region. It groups four Colombian universities and four Venezuelan institutions. The two main objectives of CEVALE2 are the development and transfer of collaborative and organizational platforms in the area and the creation of opportunities for the dissemination of particle physics such as courses and seminars. A cycle of conferences has been organized during June 2014 for teachers and students in the member institutions. The ATLAS Virtual Visit will be a key part of this experience.

Acelerador de partículas
¿Qué acelerar!
Partículas cargadas eléctricamente
Motor
Campos eléctricos
Dirección y control
Campos magnéticos



At the front-end and back-end of the Virtual Visit Venezuela + Colombia 2016

3.4 Public Lectures & Diplomacy



Ciencias Naturales

Física de Partículas en tres actos: Teorías, instrumentos y resultados (Acto 1)

by Dr. Bárbara Millán (Abril 2016) de Databo Booking.com

martes, 3 de junio de 2014 desde 19:00 para 20:00 (UTC) at Centro Virtual de Altos Estudios en Altas Energías (VideoConferencia)

MONDAY, 25 JULY, 2016 RÉPLICAS Y CONTRARRÉPLICAS HAGA SU DENUNCIA PRIMERA PÁGINA NOSOTROS

La Razón

PERIODISMO INDEPENDIENTE

HISTORIAS PERSONAJES OPINIÓN ESPECIALES EDITORIAL HAGA SU DENUNCIA

Venezuela debe crear las condiciones para que regresen sus científicos

Por Gabriela Rojas - Jun 30, 2015

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ATLAS

Discover About, Physics, Collaboration, Detector Resources Multimedia, Activities, Educators, Visit, Press Updates News, Physics Briefings, Blog, Statements

Updates Latest News, Physics Briefings, Collaboration Blog, and Press Statements from ATLAS.

Meet 7 inspiring women from the ATLAS experiment

In celebration of International Women's Day 2016

by Barbara Anthony, 20th August 2016

Women play key roles in the ATLAS Experiment: from young physicists at the start of their careers to analysis group leaders and spokespersons of the collaboration. Celebrate International Women's Day by meeting a few of these inspiring ATLAS researchers.

Stella Torcat / Departamento de Información y Medios USB.

Portada Autoridades USB Acerca de Equipo Editorial Contáctenos

Usebistas participaron en clase de física de partículas dictada por científicos del CERN

DEPARTAMENTO DE INFORMACIÓN Y MEDIOS - 29 ABRIL, 2016
PUBLICADO EN: EN BREVES, ESTUDIANTES, EVENTOS

Stella Torcat / Departamento de Información y Medios USB.

Veinte estudiantes de la Universidad Simón Bolívar, 19 de pregrado y uno de postgrado, participaron en la MasterClasses 2016, un evento internacional de enseñanza de física de partículas, organizado por primera vez en Venezuela.

La clase puede consultarse en <https://indico.cern.ch/event/510325/> y fue dictada por Reina Camacho, Daniela Paredes, Camila Rangel Smith y Arturo Sánchez, investigadores venezolanos que forman parte del Centro Virtual de Altos Estudios en Altas Energías Venezuela (Cevale2 VE), quienes trabajan en la Organización Europea para la Investigación Nuclear (CERN, por sus siglas en francés), en Ginebra.

En la jornada los estudiantes realizaron una práctica de análisis de datos, con datos reales de ATLAS, y con ella hallaron la masa del bosón Z.

We have been looking to communicate the projects and results to the public and diplomatic members. And, **we always get help of different media here and there, thanks!**



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Summary

The CEVALE2VE is a HEP educational and outreach project for Latin America. With the help of a lot of people in both side of the ocean, we developed a course in particle physics as an “excuse” to create and strengthen ties between members of the scientific community.

Several students have got a good start in their advance studies thanks to this collaboration and their incredible energies: some of our students have participated in the HEP CERN-LA school, CERN/DESY summer student programs

Next project? With the ICTP Physics Without Frontiers program, sponsored by ATLAS, in October 2016, we go to Venezuela and Colombia for personal contact with the students, professors and general public in several outreach activities for two weeks!

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Backup

