

## ANDES Before 2020



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## Many things to do

- ▶ Finish the design studies
- ▶ Include ANDES in the civil work
- ▶ Plan the support laboratories
- ▶ Work on the academic content
- ▶ Design experiments and start prototyping
- ▶ Integrate in international existing collaborations
- ▶ ...

## A specific question

- ▶ Do we want another underground laboratory (sooner)
  - ▶ A small underground laboratory in a mine or existing tunnel in South America/South Africa/Mexico

# Possible mines in South America



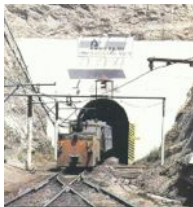
# Possible mines in South America



Sierra Grande (Río Negro)  
*Iron - 400 m*



Pascua Lama (San Juan)  
*Gold and Silver - 1500 m*



Mina Aguilar (Jujuy)  
*Lead, Silver and Zinc - 800 m*



El Teniente (Chile)  
*Copper - 700 m*

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# Possible mines in South America

## Sierra Grande

- ▶ Site used 1994-1997:  
*Search for an annual modulation of dark-matter signals with a germanium spectrometer at the Sierra Grande laboratory*  
*Astropart.Phys. 10 (1999) 133-139*
- ▶ Horizontal access
- ▶ Mine closed in 2001, reopened by Chinese in 2010

## Pascua Lama

- ▶ 2 km tunnel between Argentina and Chile (mineral extracted in Chile, processed in Argentina)
- ▶ Tunnel foreseen just for a conveyor belt and not built yet
- ▶ Mining in Chile stopped for legal reasons (glaciers/native people)
- ▶ Project frozen since last November

# Possible mines in South America (cont.)

## Mina Aguilar

- ▶ 4000-5000 m.a.s.l
- ▶ Site for Cosmic Ray measurements in 1953
- ▶ Visited in 2007 (as a site for high altitude Cosmic Ray experiment)
  - ▶ Very well treated by the company
- ▶ Good contact with General manager of the mine
- ▶ Waiting for answers from his "superiors" since May 2013

## El Teniente

- ▶ Largest copper mine in the world
- ▶ State-own company (Codelco)
- ▶ Occasional contacts

# An underground laboratory in South Africa?

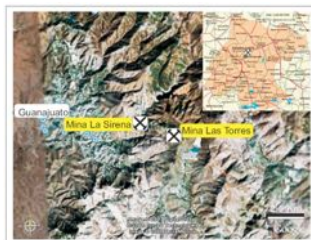


Huguenot tunnel: 4 km long, 700 m deep



# An underground laboratory in Mexico?

## LSMM site search in 2007



Many possible sites:

- ▶ Guanajuato
  - ▶ Mina La Sirena
  - ▶ Mina Las Torres
- ▶ Hidalgo
  - ▶ Mina Dificultad
  - ▶ Mina La Rica
- ▶ Zacatecas
  - ▶ Mina de San Martín
  - ▶ Mina de Sabinas
  - ▶ Mina Proaño
- ▶ Good direct contact with the mines

# ANDES Before 2020?

