

El Sauce Observatory

Telescope Hosting in Chile :
Summary of the construction of a world-class observatory

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¹ObsTech
El Sauce Observatory
Rio Hurtado
CHILE

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The Actors



The Actors



Astrophysics Professor / Exoplaneteer
Pontificia Universidad Católica de Chile
Hat-SOUTH Chile / CHAT

■ Andrés Jordán

The Actors



Astrophysics Professor / Exoplaneteer
Pontificia Universidad Católica de Chile
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- Andrés Jordán
- Santiago Royo



Optics Professor
Universidad Politécnica de Catalunya
CD6 - Laboratoire de Capteurs &
systèmes

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- Vincent Suc



Optics Professor
Universidad Politécnica de Catalunya
CD6 - Laboratoire de Capteurs & systèmes



Telescope Engineer, Ph.D.
Astro-Engineering @PUC
V.P. SIRENE
Local Support @Clay 6.5m F/5
Hat-SOUTH/CHAT



HAT-SOUTH experience

HAT-SOUTH

Installed at Las Campanas in 2010

8 Telescopes

50+ Exoplanets



HAT-SOUTH experience

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- Support is expensive for the observatories

HAT-SOUTH experience

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- Support is expensive for the observatories
- Few dedicated on-site support

HAT-SOUTH experience

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8 Telescopes

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- Support is expensive for the observatories
- Few dedicated on-site support
- Limited Bandwidth

HAT-SOUTH experience

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- Support is expensive for the observatories
- Few dedicated on-site support
- Limited Bandwidth
- Running Cost is transferred to the hosting fee of the projects

HAT-SOUTH experience

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- Support is expensive for the observatories
- Few dedicated on-site support
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- **THERE IS A SCIENTIFIC INTEREST FOR A DEDICATED STRUCTURE**

HAT-SOUTH experience

HAT-SOUTH

Installed at Las Campanas in 2010

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- Support is expensive for the observatories
- Few dedicated on-site support
- Limited Bandwidth
- Running Cost is transferred to the hosting fee of the projects
- **THERE IS A SCIENTIFIC INTEREST FOR A DEDICATED STRUCTURE**
- **LONG TERM INTEREST FOR AMATEUR ASTRONOMERS !**

The need

- A dedicated **PROFESIONAL** structure



The need

- A dedicated **PROFESIONAL** structure
- Garantee **PERENNITY**



The need

- A dedicated **PROFESIONAL** structure
- Garantee **PERENNITY**
- Acces from the capital < 8h



The need

- A dedicated **PROFESIONAL** structure
- Garantee **PERENNITY**
- Acces from the capital < 8h
- Very high bandwidth Internet



The need

- A dedicated **PROFESIONAL** structure
- Garantee **PERENNITY**
- Acces from the capital < 8h
- Very high bandwidth Internet
- Capacity : 50-100 Telescopes



The need

- A dedicated **PROFESIONAL** structure
- Garantee **PERENNITY**
- Acces from the capital < 8h
- Very high bandwidth Internet
- Capacity : 50-100 Telescopes
- **FINANCIALLY ACCESSIBLE
TO AMATEURS ASTRONOMERS**



Funding

Destination

Installations

Salaries

2 years White Run

Funding

Destination

Installations

Salaries

2 years White Run

- ObsTech is a UC Spin-Off (Universidad Católica)

Funding

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- ObsTech is a UC Spin-Off (Universidad Católica)
- 50% CORFO Funding

Funding

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- ObsTech is a UC Spin-Off (Universidad Católica)
- 50% CORFO Funding
- 50% Private Funding

Funding

Destination

Installations

Salaries

2 years White Run

- ObsTech is a UC Spin-Off (Universidad Católica)
- 50% CORFO Funding
- 50% Private Funding
- Collaboration with CHILESCOPE

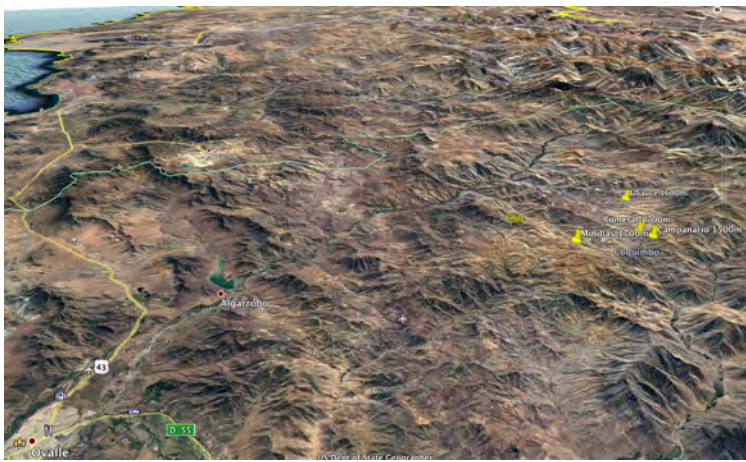
The Short List



The Short List



The Short List



The Short List

Short-List



The Short List

Short-List

- Site1 : Campanario



The Short List

Short-List

- Site1 : Campanario
- Site2 : Romeral



The Short List

Short-List

- Site1 : Campanario
- Site2 : Romeral
- Site3 : Minillas



The Short List

Short-List

- Site1 : Campanario
- Site2 : Romeral
- Site3 : Minillas
- Site4 : ElSauce



Types of land owners

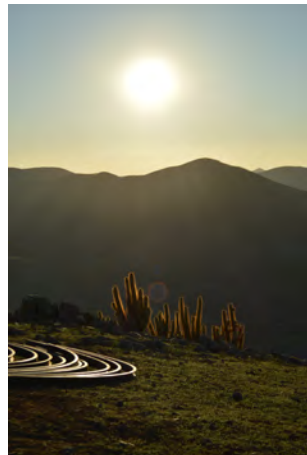
Land owners



Types of land owners

Land owners

- Site1 : Campanario -> Family community

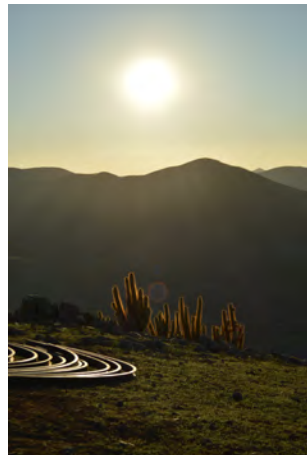


Types of land owners

Land owners

- Site1 : Campanario -> Family community
- Site2 : Romeral -> Farming community

50-100 owners - Legal Restrictions -> **Danger!**

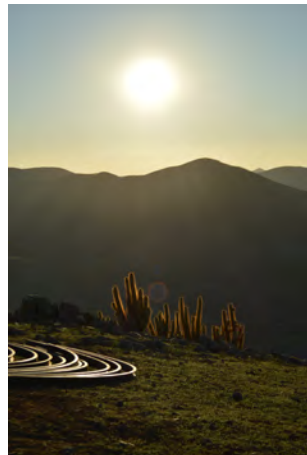


Types of land owners

Land owners

- Site1 : Campanario -> Family community
- Site2 : Romeral -> Farming community
- Site3 : Minillas -> Farming community

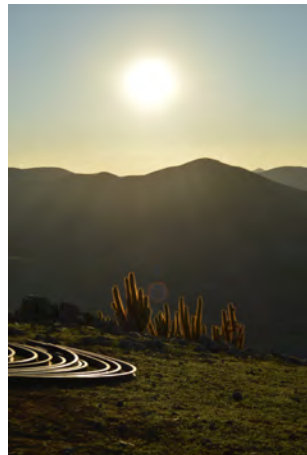
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Types of land owners

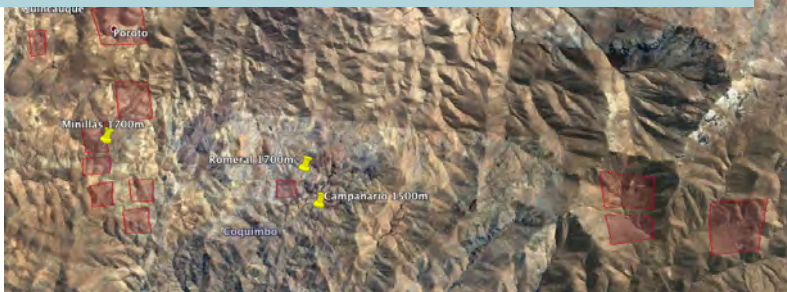
Land owners

- Site1 : Campanario -> Family community
- Site2 : Romeral -> Farming community
- Site3 : Minillas -> Farming community
- Site4 : ElSauce -> Single owner



Ownership study

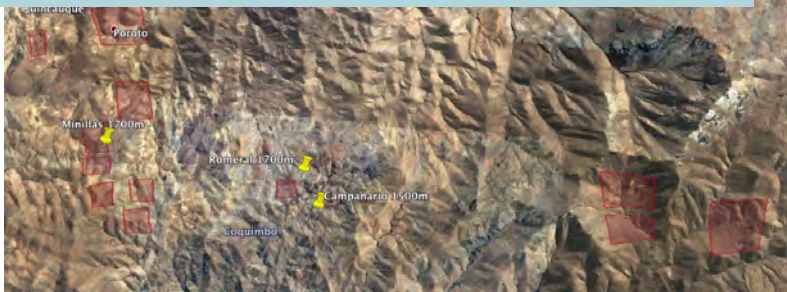
Mining



Ownership study

Mining

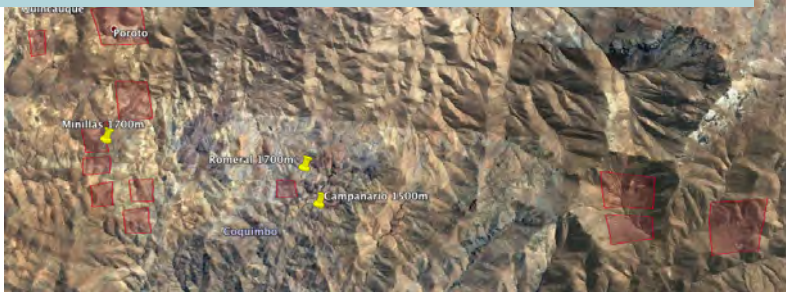
- Site1 : Campanario -> 1 Prospection authorization 2km North-West



Ownership study

Mining

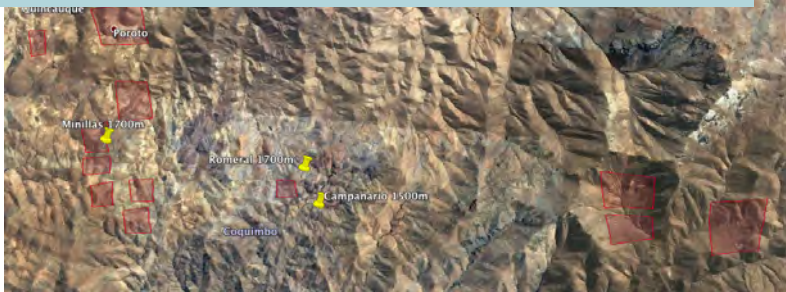
- Site1 : Campanario -> 1 Prospection authorization 2km North-West
- Site2 : Romeral -> 1 Prospection authorization 2km South-West



Ownership study

Mining

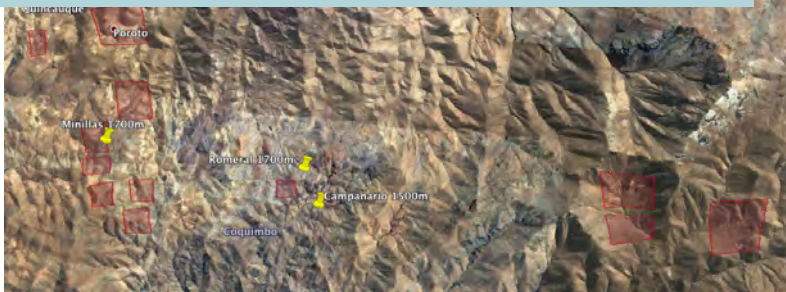
- Site1 : Campanario -> 1 Prospection authorization 2km North-West
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Ownership study

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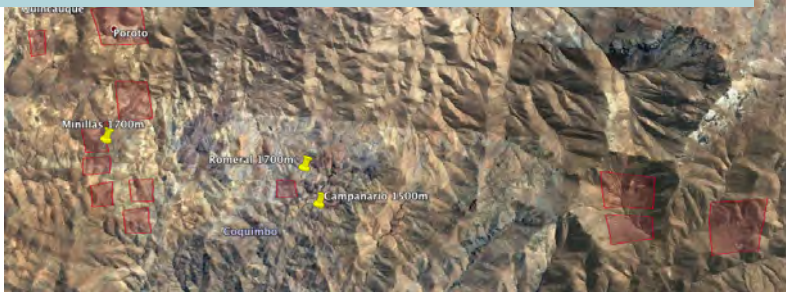
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- ~~Site3 : Minillas~~ -> Many operation right recently authorized (Rare earth minerals)
DANGER !



Ownership study

Mining

- Site1 : Campanario -> 1 Prospection authorization 2km North-West
- Site2 : Romeral -> 1 Prospection authorization 2km South-West
- ~~Site3 : Minillas~~ -> Many operation right recently authorized (Rare earth minerals)
DANGER !
- Site4 : ElSauce -> Old mine which exploitation terminated 5 years ago 10km south-east



Seeing measurements

Seeing measurements



Seeing measurements

Seeing measurements

- DIMM C11



Seeing measurements

Seeing measurements

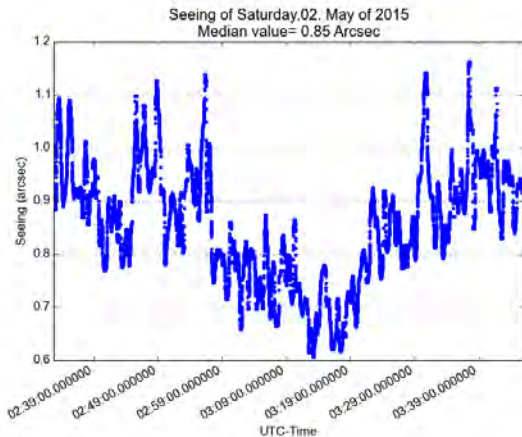
- DIMM C11
- 2 weeks on each site 2, 3 et 4



Seeing measurements

Seeing measurements

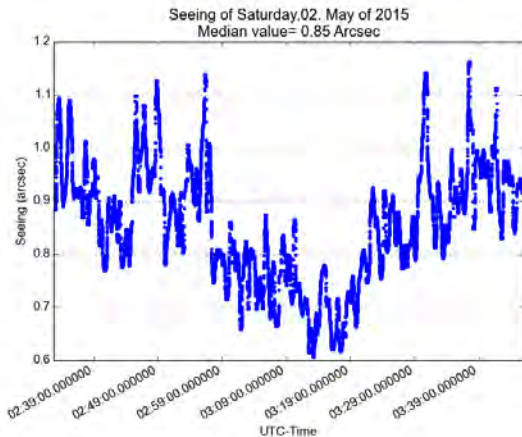
- DIMM C11
- 2 weeks on each site 2, 3 et 4
- Correlation with Gemini



Seeing measurements

Seeing measurements

- DIMM C11
- 2 weeks on each site 2, 3 et 4
- Correlation with Gemini
- L'altitude does not make a difference
- **El Sauce gets better results**



Creation of 3km unpaved access



Électricité

Starting pack



Électricité

Starting pack

- 40X pannels 320W



Électricité

Starting pack

- 40X pannels 320W
- 24X 210Ah



Électricité

Starting pack

- 40X pannels 320W
- 24X 210Ah
- Diesel Generator 5.5kW



Électricité

Starting pack

- 40X pannels 320W
- 24X 210Ah
- Diesel Generator 5.5kW
- **Goal : 3 days without Sun !**



Internet

Main Connexion



Internet

Main Connexion

- Fiber line opening



Internet

Main Connexion

- Fiber line opening
- Association with the provider Local WISPING



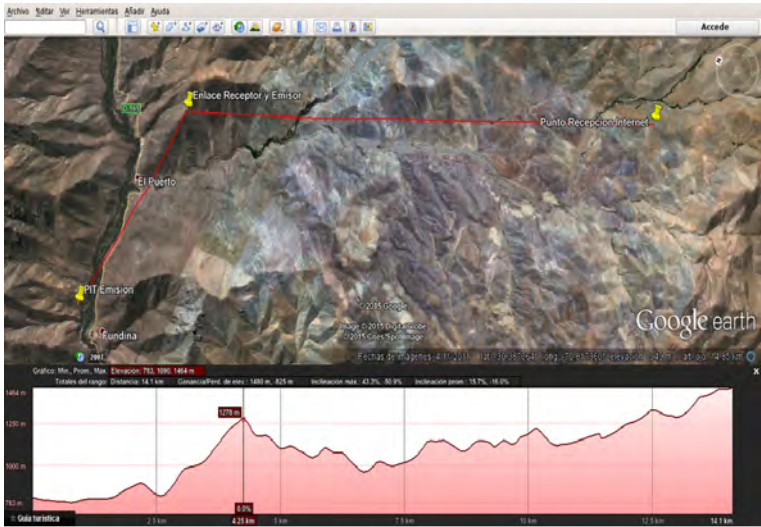
Internet

Main Connexion

- Fiber line opening
- Association with the provider Local WISPING
- Relay 5GHz a 300Mb/s over 15km



Internet



Internet

Main Connexion

- Fiber line opening
- Association with the provider Local WISPING
- Relay 5GHz a 300Mb/s over 15km
- Obtention of licences



Internet

Main Connexion

- Fiber line opening
- Association with the provider Local WISPING
- Relay 5GHz a 300Mb/s over 15km
- Obtention of licences
- Dedicated **75Mb/s Symmetric!**



Internet

Main Connexion

- Fiber line opening
- Association with the provider Local WISPING
- Relay 5GHz a 300Mb/s over 15km
- Obtention of licences
- Dedicated **75Mb/s Symmetric!**
- Local returns



INTERNET ACCESS FOR THE SCHOOL AND EDUCATIONAL PROJECTS !

Internet

Main Connexion

- Fiber line opening
- Association with the provider Local WISPING
- Relay 5GHz a 300Mb/s over 15km
- Obtention of licences
- Dedicated **75Mb/s Symmetric!**
- Local returns
- Regional returns



INTERNET ACCESS FROM SAMO ALTO TO RIO HURTADO (80KM) EXISTS THANKS TO THE EXISTENCE OF THE OBSERVATORY !



Chilescope

October 2015 :



Chilescope

November 2015 :



Chilescope

July 2016 :



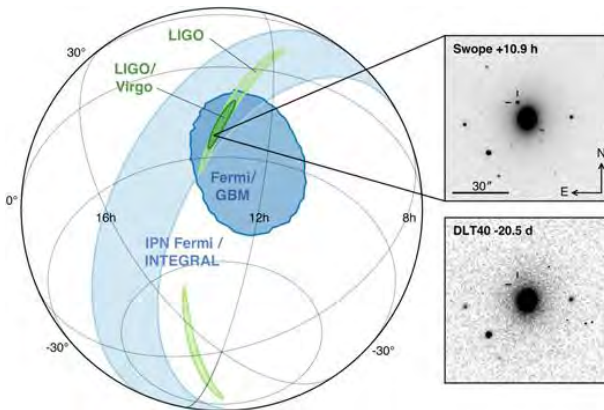
Chilescope

Operation : December 2016 :



Chilescope

August 2017 : Kilonova



ObsTech

February 2016 : Construction starts



ObsTech

November 2016 : First telescope



ObsTech

Mars 2017 : Ciel Austral and the Telescope #9th !



El Sauce Today

Evolution since January 2017

El Sauce Today

Evolution since January 2017

- Battery Capacity X4

El Sauce Today

Evolution since January 2017

- Battery Capacity X4
- Internet 100Mb/s + Backup 70Mbps + 4G

El Sauce Today

Evolution since January 2017

- Battery Capacity X4
- Internet 100Mb/s + Backup 70Mbps + 4G
- 4 new buildings



El Sauce Today

Evolution since January 2017

- Battery Capacity X4
- Internet 100Mb/s + Backup 70Mbps + 4G
- 4 new buildings
- 8 employees full time

El Sauce Today

Evolution since January 2017

- Battery Capacity X4
- Internet 100Mb/s + Backup 70Mbps + 4G
- 4 new buildings
- 8 employees full time
- 2 guards and one technician on site

El Sauce Today

Evolution since January 2017

- Battery Capacity X4
- Internet 100Mb/s + Backup 70Mbps + 4G
- 4 new buildings
- 8 employees full time
- 2 guards and one technician on site
- Continuous presence

El Sauce Today

Evolution since January 2017

- Battery Capacity X4
- Internet 100Mb/s + Backup 70Mbps + 4G
- 4 new buildings
- 8 employees full time
- 2 guards and one technician on site
- Continuous presence
- 30 telescopes operating



El Sauce Today

Evolution since January 2017

- Battery Capacity X4
- Internet 100Mb/s + Backup 70Mbps + 4G
- 4 new buildings
- 8 employees full time
- 2 guards and one technician on site
- Continuous presence
- 30 telescopes operating
- **35 telescopes August 2019**



The Service "El Sauce"

Internet service

The Service "El Sauce"

Internet service

- Main Connexion 100Mb/s Symmetric
MOVISTAR

The Service "El Sauce"

Internet service

- Main Connexion 100Mb/s Symmetric MOVISTAR
- Backup 50Mbs ENTEL Pichasca

The Service "El Sauce"

Internet service

- Main Connexion 100Mb/s Symmetric MOVISTAR
- Backup 50Mbs ENTEL Pichasca
- Backup 20Mbs ENTEL Monte Patria

The Service "El Sauce"

Internet service

- Main Connexion 100Mb/s Symmetric MOVISTAR
- Backup 50Mbs ENTEL Pichasca
- Backup 20Mbs ENTEL Monte Patria
- Backup 4G only as a last solution

The Service "El Sauce"

Technical Service

- Guards 24/7

The Service "El Sauce"

Technical Service

- Guards 24/7
- On-Site Amateur Astronomer

The Service "El Sauce"

Technical Service

- Guards 24/7
- On-Site Amateur Astronomer
- Missions from Santiago

The Service "El Sauce"

Technical Service

- Guards 24/7
- On-Site Amateur Astronomer
- Missions from Santiago
- Installations on-demand

The Service "El Sauce"

Technical Service

- Guards 24/7
- On-Site Amateur Astronomer
- Missions from Santiago
- Installations on-demand
- CNC access, workshops etc.

The Service "El Sauce"

Technical Service

- Guards 24/7
- On-Site Amateur Astronomer
- Missions from Santiago
- Installations on-demand
- CNC access, workshops etc.
- **We do not have "Second Class" clients**

The Service "El Sauce"

The team : (Historical order)

- Vincent Suc
- Andres Jordan
- Santi Royo

The Service "El Sauce"

The team : (Historical order)

- Vincent Suc
- Andres Jordan
- Santi Royo
- Samuel Ropert

Electrical Engineer UC
Programmer
Missions from Santiago

The Service "El Sauce"

The team : (Historical order)

- Vincent Suc
- Andres Jordan
- Santi Royo
- Samuel Ropert
- Laureano Pizarro

Guard
24/7
Emergency Technician

The Service "El Sauce"

The team : (Historical order)

- Vincent Suc
- Andres Jordan
- Santi Royo
- Samuel Ropert
- Laureano Pizarro
- Edys Flores

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24/7
Emergency Technician

The Service "El Sauce"

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- Andres Jordan
- Santi Royo
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- Laureano Pizarro
- Edys Flores
- Rodrigo Rojas

Electrical Engineer
Missions from Santiago

The Service "El Sauce"

The team : (Historical order)

- Vincent Suc
- Andres Jordan
- Santi Royo
- Samuel Ropert
- Laureano Pizarro
- Edys Flores
- Rodrigo Rojas
- Giselle Ulloa

Coordinator/Administrator
Importations - Documentation - Customs
Santiago

The Service "El Sauce"

The team : (Historical order)

- Vincent Suc
- Andres Jordan
- Santi Royo
- Samuel Ropert
- Laureano Pizarro
- Edys Flores
- Rodrigo Rojas
- Giselle Ulloa
- Vicente Armstrong

Mechanic Engineer
Mechanical Design
Missions from Santiago

The Service "El Sauce"

The team : (Historical order)

- Vincent Suc
- Andres Jordan
- Santi Royo
- Samuel Ropert
- Laureano Pizarro
- Edys Flores
- Rodrigo Rojas
- Giselle Ulloa
- Vicente Armstrong
- Jonathan Fertil

Astrophotograph / Amateur Astronomer
On-site Technicien
Emergencies / Lives on site

Service "El Sauce"

Tarif :

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Tarif :

- No Pro/am difference in pricing

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- CLP 5.000.000/year : 6600 euros/year (540 euros/month)
- No Entry fee

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- Possibility of a dedicated building

Service "El Sauce"

Tarif :

- No Pro/am difference in pricing
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- No Bandwidth Limitation
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Service "El Sauce"

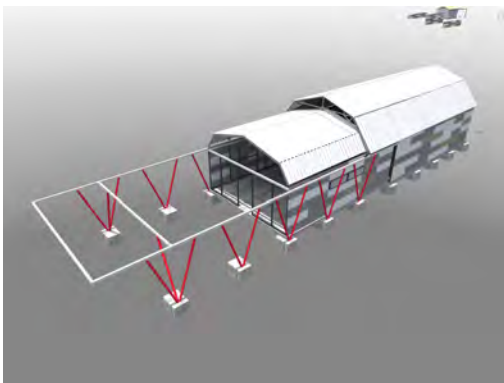
Tarif :

- No Pro/am difference in pricing
- CLP 5.000.000/year : 6600 euros/year (540 euros/month)
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- Extra charge if surface >9m2
- Possibility of a dedicated building
- No Bandwidth Limitation
- Extra if upload > 10GB/jour
- **SUPPORT IS INCLUDED**

Upcoming projects

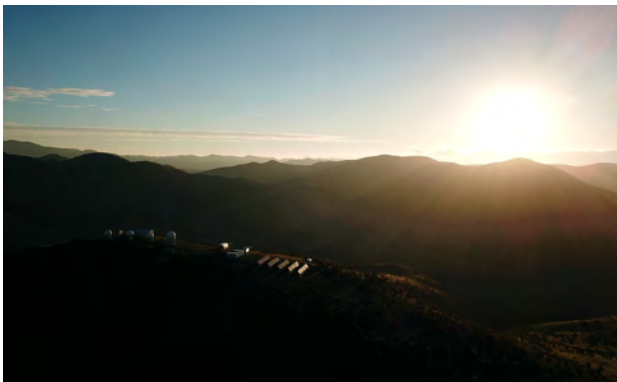
Upcoming projects

- Roll-Off X11 (Capacity for 11 additional telescopes Q3 2019)



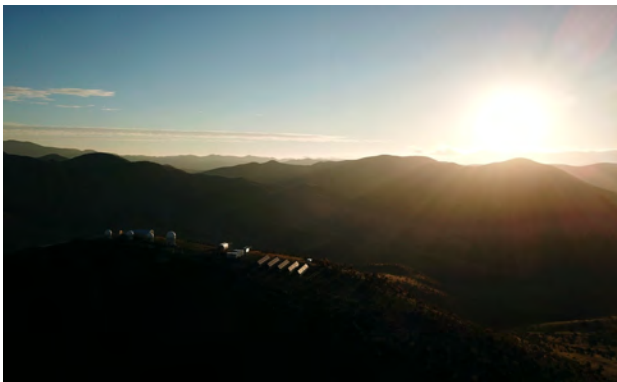
Upcoming projects

- Roll-Off X11 (Capacity for 11 additional telescopes Q3 2019)
- Eclipse 2019



Upcoming projects

- Roll-Off X11 (Capacity for 11 additional telescopes Q3 2019)
- Eclipse 2019
- Cabin Q3 2019



Questions

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