Workshop on Robotic Autonomous Observatories
Torremolinos, Malaga, Spain, 18-21 May 2009

Montegancedo Observatory: The First Free Access Astronomical Observatory Teleoperated Via the Internet

http://om.fi.upm.es

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2.- Observatory description
3.- Software Architecture
4.- Astronomical events & broadcasting
5.- Free observation
6.- Future works
7.- Conclusions
8.- Acknowledge

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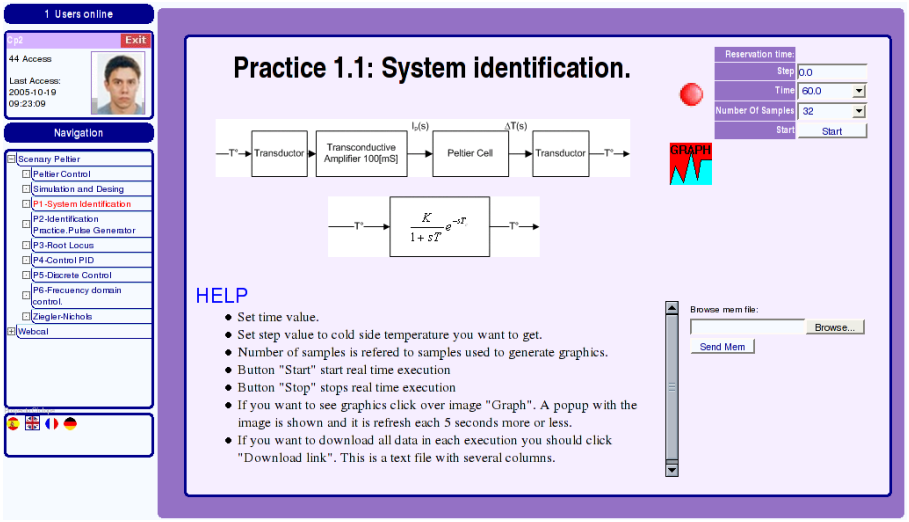
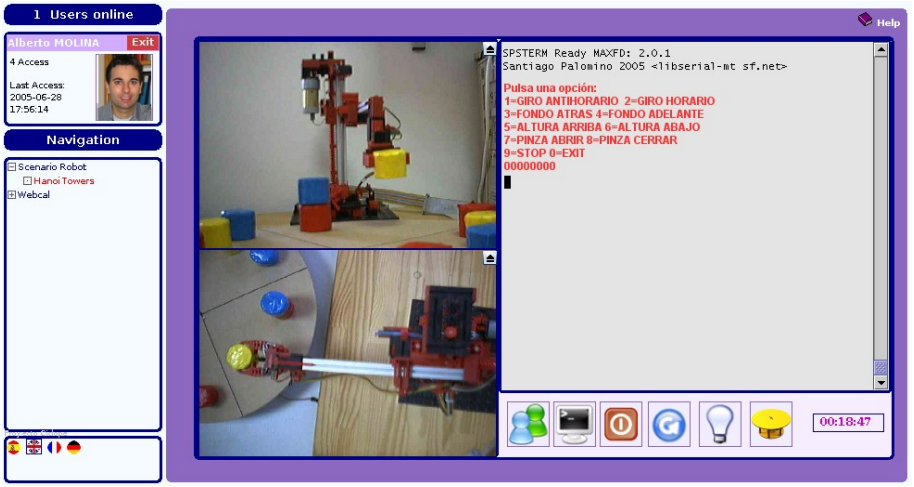
1. Introduction

- **Who we are?**

  Ciclope: Project of collaborative e-learning & e-research

  - Remote laboratories
  - Philosophy: Free knoledge
  - Arquitectura FOSS
  - Web 2.0
  - Started in 1996 with TITERE web lab
    - www.ciclope.info/titere
  -





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Montegancedo Observatory

http://om.fi.upm.es

1. Introduction

- **What is Montegancedo Observatory?**

  Remote access Astronomical Observatory teleoperated via the Internet.

- Test bed of Ciclope Astro Free software
  - http://sourceforge.net/projects/castro/

1. Introduction

Montegancedo Observatory Objectives

- Initiation to Astronomy with professional astronomers supervision
- OM is a Web 2.0 for e-learning and e-research
- To form a web community of people who learn Astronomy
- To generate free access learning material by the community
- Encourage good work. Community vote every single action each user does. *Pictures, tutorials, comments, etc*
- User's reputation deliver observation time
  - Karma, page rank importance algorithm
- Anybody with Internet connection can access to the telescope
- Tasks to be performed
  - On line work: Observation (Real experimentation)
  - Off line work: Data analysis, voting, content generation
  - Broadcasting astronomical events

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N40°24'20.88"

N40°24'21.6"

N40°24'22.32"

ASTRONOMIC OBSERVATORY OF UPM

N40°24'23.04"

W 3°50'22.2"

W 3°50'20.4"

W 3°50'18.6"

W 3°50'16.8"

3°50'15"

N40°24'23.76"

N40°24'24.48"

N40°24'25.2"

N40°24'25.92"

© 2007 Europa Technologies
Image © 2007 DigitalGlobe
©2006 Google™

Puntero 40°24'23.25"N 3°50'19.08" O elev 717 m Secuencia 100% Alt. ojo 890 m

2. Observatory description

- ✓ Where are we?: Facultad de Informática UPM, Boadilla del Monte – Madrid SPAIN

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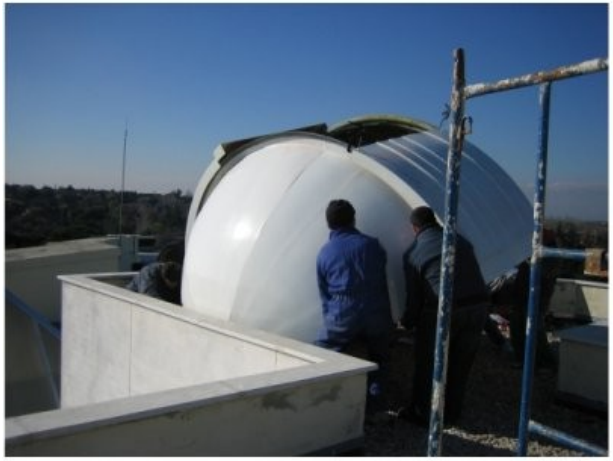
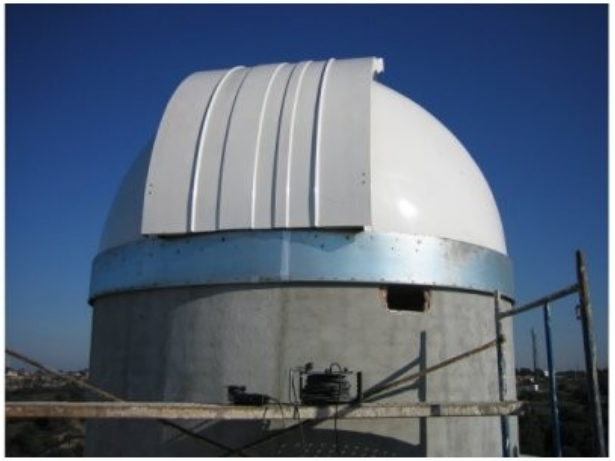
2. Observatory description

Dome assembly (December *20th, 2006)*

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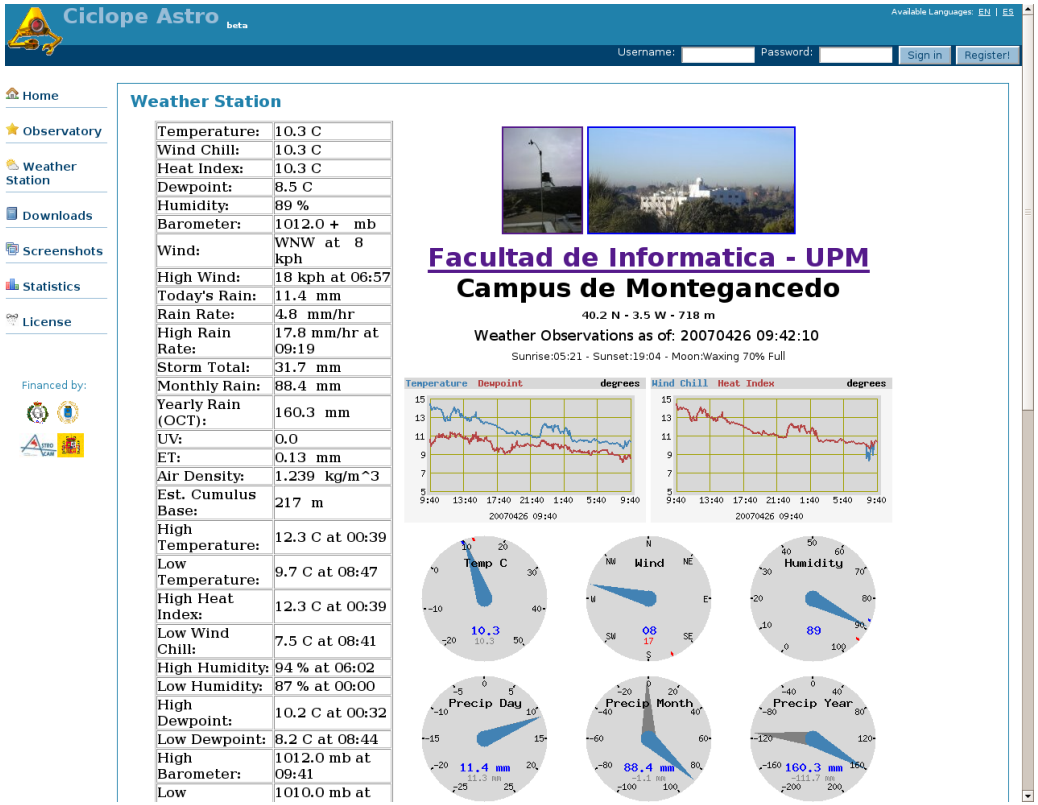
Montegancedo Observatory

http://om.fi.upm.es



Live weather station information

http://www.ciclope.info/weather/

Setup

(*February 5th, 2007*)

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Montegancedo Observatory

http://om.fi.upm.es

Pedestal (*February 23rd, 2007)*

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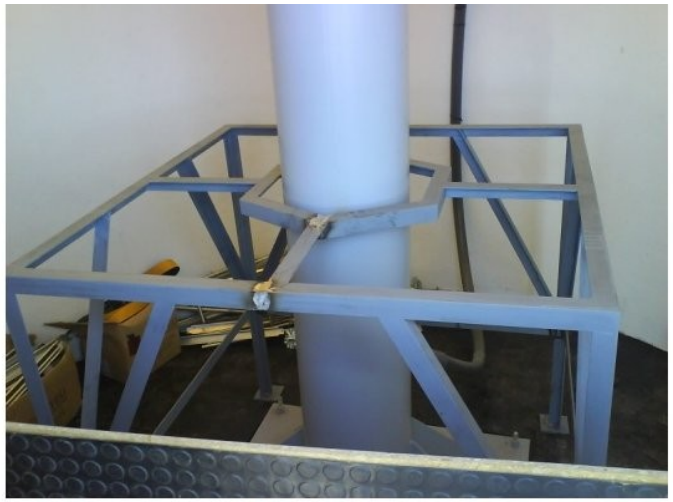
Montegancedo Observatory

http://om.fi.upm.es



Floor (March *21st, 2007)*

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Montegancedo Observatory

http://om.fi.upm.es

End of work (June 2007)

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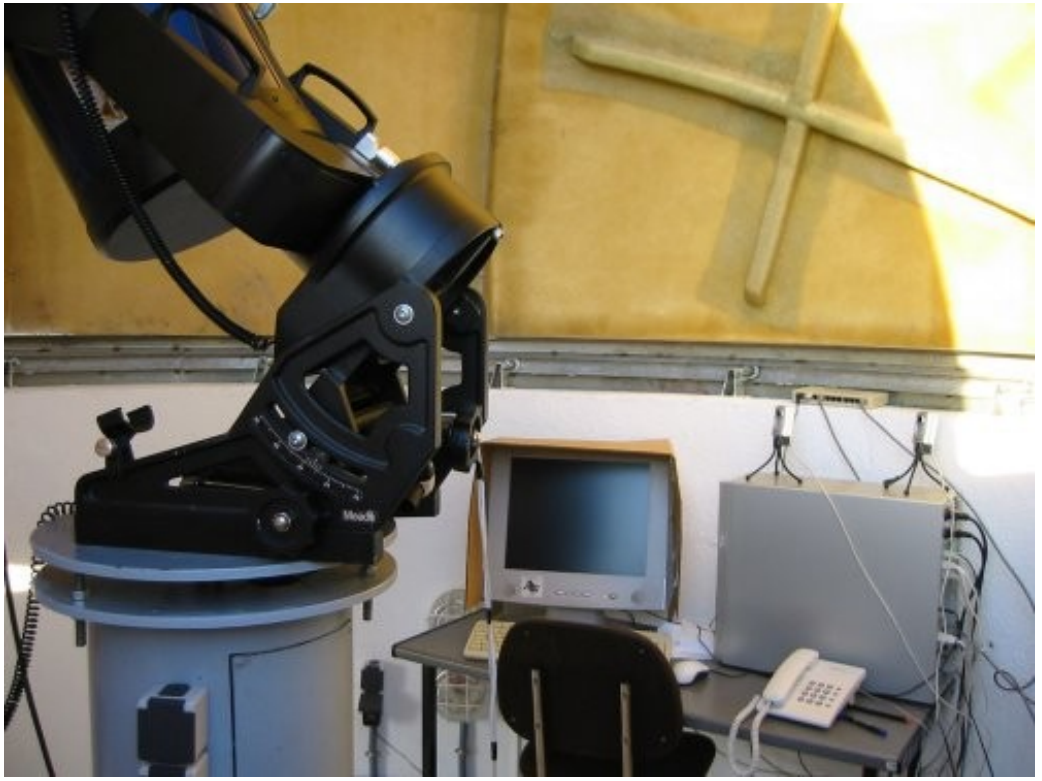
Montegancedo Observatory

http://om.fi.upm.es



Inside the observatory

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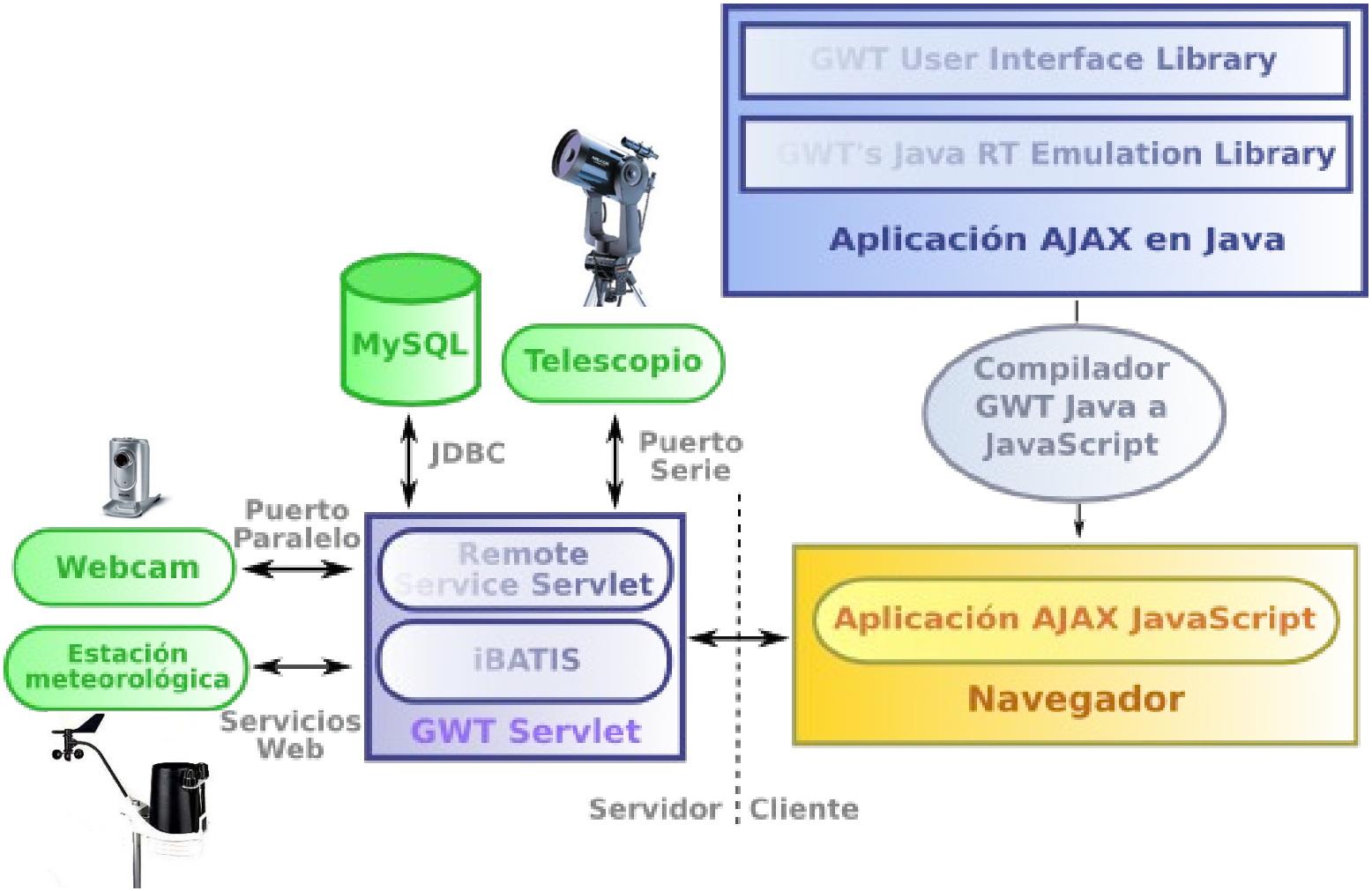
3. Ciclope Astro Free Software Architecture



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Montegancedo Observatory

Montegancedo Astronomical Observatory - Mozilla Firefox

Archivo Editar Ver Historial Marcadores Herramientas Ayuda

http://om.fi.upm.es/CiclopeAstro/?locale=en

Jornadas de Automática » universidad ... | Montegancedo Astronomical Obs... | SourceForge.net: Ciclope Astro

Powered by Ciclope Astro beta

Available Languages: EN | ES

Forgot your password? Username: Password: Sign in Register!

Home | Public Telescope | Album | Chose a name! | Reservations | News | Community

- Home
- Observatory
- Screenshots
- Financing
- Contact us
- Wiki

Server Time: 07:15 UTC

Welcome to Montegancedo Observatory!

This is the first free access astronomical observatory of the world, made by the "Collaborative Learning Group" Ciclope.

The **aim** is to build up a **community** who learn Astronomy and, why not? maybe discover new something.

We would like to make the 100% of the timetable. It will be extended it, adding new experiments and observations to other celestial objects.

The Access Conditions will be changed to make the most of full time. We will try to please to the beginner and the advanced user. It is not an easy task! Please, be understanding.

All the content made by the community will be public, under "copyleft" licenses.

Visit the control interface and see what is happening now in the Observatory.

Click here!

Webcam on UPM Observatory
(updated each 20 seconds)

Horario apertura:
Lunes a Viernes de 7:00 - 16:00 (UTC).

Estado de la cúpula: CERRADA

¡Novedad! Concurso fotográfico
Sube tu foto de la Estación Espacial Internacional y participa en el concurso.

¡Nuevo! ¡Entra y CHATEA!

07:15:10, 05/21/09 UTC

Temperature	19.9 C
Wind Chill	19.9 C
HeatIndex	19.9 C
Humidity	51 %
Dewpoint	9.4 C
Barometer	1009.9 mb
Wind	ENE at 5 kph
Rain Today	0.0 mm
Rain Rate	0.0 mm
Sunrise	04:54 UTC
Sunset	19:31 UTC
Moon phase	Waning 13% Full
Prediction	Increasing clouds with little temperature change.

(Updated every minute)

Data obtained from Ciclope Weather!

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Website designed for Firefox Browser [Optimized for 1024x768 resolution]

W3C XHTML 1.0 W3C CSS 2.0

http://sourceforge.net/projects/castro/

Ciclope Astro Free Software Features

- ✓ Web 2.0
  - Collaborative content generation by a community
  - Collaborative real time teleoperation of a observatory
  - The user is the protagonist
  - Easy interface, doesn't require technical knowledge
  - Access with a browser
- ✓ User profiles
  - Beginners / normal / advance / professional/ Administrator
- ✓ Karma based reputation system
- ✓ Core software
  - registration/loging
  - Reservation managing system
  - Teleoperation software(telescope, dome, cameras, focus)
  - Different scenarios / experiments

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Web Collaborative Tools

- Currently
  - Astrophotography, image acquisition programming
  - Chat
  - Astronomical encyclopaedia (Wiki)
  - Astronomic album (folksonomy or collaborative tagging)
- Developing
  - Forum
  - Image processing tools
  - Questionaires (question-answer quiz)
  - News (RSS)
  - Voice – IP (SIP)
  - P2P broadcasting

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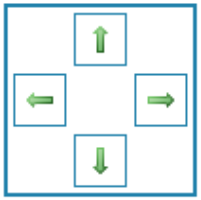
Interfaces for controlling the telescope

Basic Control

This panel lets control the telescope in an easy way, with the only next options:

- Move 1 sec. Telescope East, North, South and West at current slew rate.
- Set slew rate.
- Set focus speed and start focuser moving outward (toward objective) or inward (away from objective).



Speed:

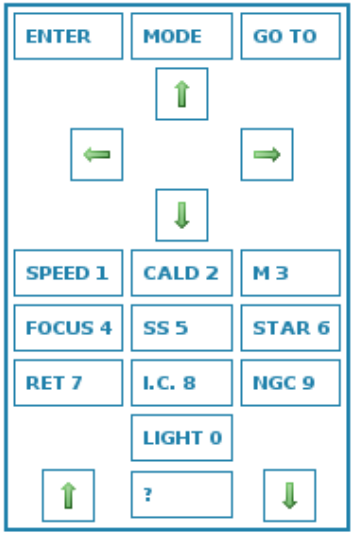
Guide	Center	Find	Max

Focus:

Fine	Slow	Medium	Fast

Autostar II Hand Controller

This panel permits to control the telescope in an advanced way through the Autostar II Hand Controller.



Celestial Objects

This panel permits to search and select a celest object from database and also move the telescope towards its coordinates (RA and DEC).

All

Search

RA: h. m. s.

DEC: + ° ' "

Slew to these coordinates

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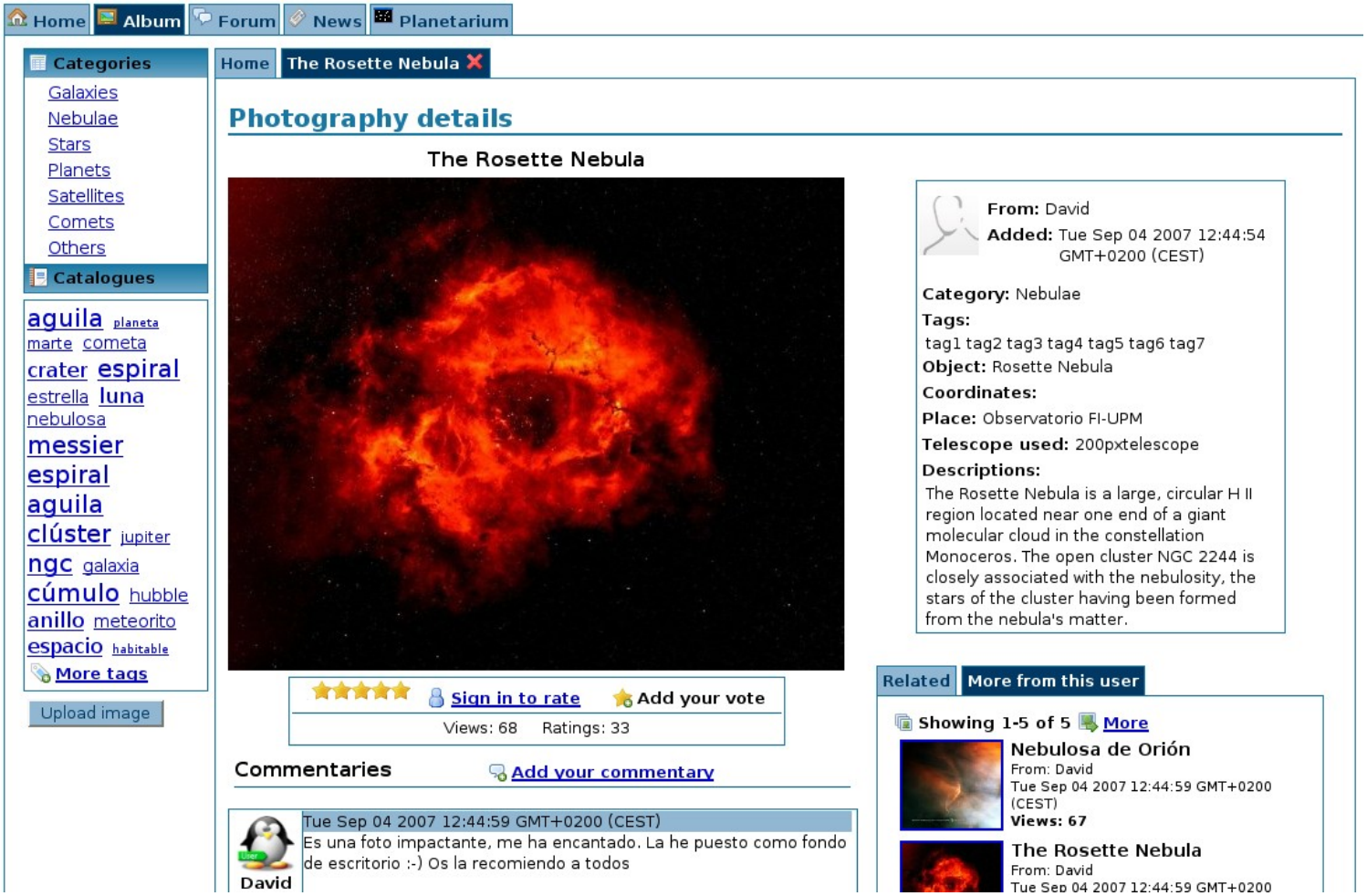
Picture album



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Managing reservation

Home | Album | Forum | News | Planetarium | Telescope | Reservations | Astrophotography

Through this calendar you can reserve several intervals to control the telescope exclusively for the reservation owner.

Colour	Meaning
	Free
	Busy
	My Reservation

You have **5** reservations each day
Each reservation is **10** minutes
To **reserve** one interval, click on the cell (marked as Free)
To **delete** one of your reservations, click it (marked as My Reservation)

< << May, 2007 >> >

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

4-5-2007

	00-10	10-20	20-30	30-40	40-50	50-60		00-10	10-20	20-30	30-40	40-50	50-60
0							12						
1							13						
2							14						
3							15						
4							16						
5							17						
6							18						
7							19						
8							20						
9							21						
10							22						
11							23						

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4.- Astronomical Events & Broadcasting

- **Broadcasting:** May 22nd, 2007 Hiding of Saturn by the Moon
- **Broadcasting:** March 3rd, 2007 Life broadcasting of Total Moon Eclipse
- **Event:** February 15th, 2008 (21:00h). Public dissemination activity in Science Museum CosmoCaixa Madrid
- **Broadcasting:** February 20th, 2008. Life broadcasting of Total Moon Eclipse
- **Event:** July 11th, 2008 (21:00h). Dissemination activity in CosmoCaixa Madrid: *The stormy pass of the solar system*
- **Broadcasting (*)**: August 1st, 2008, Total Eclipse Novosibirsk (Russia)
- April- May 2009, **Events** in 7 different small villages in Spain
- **Broadcasting (*):** July 22nd, 2009

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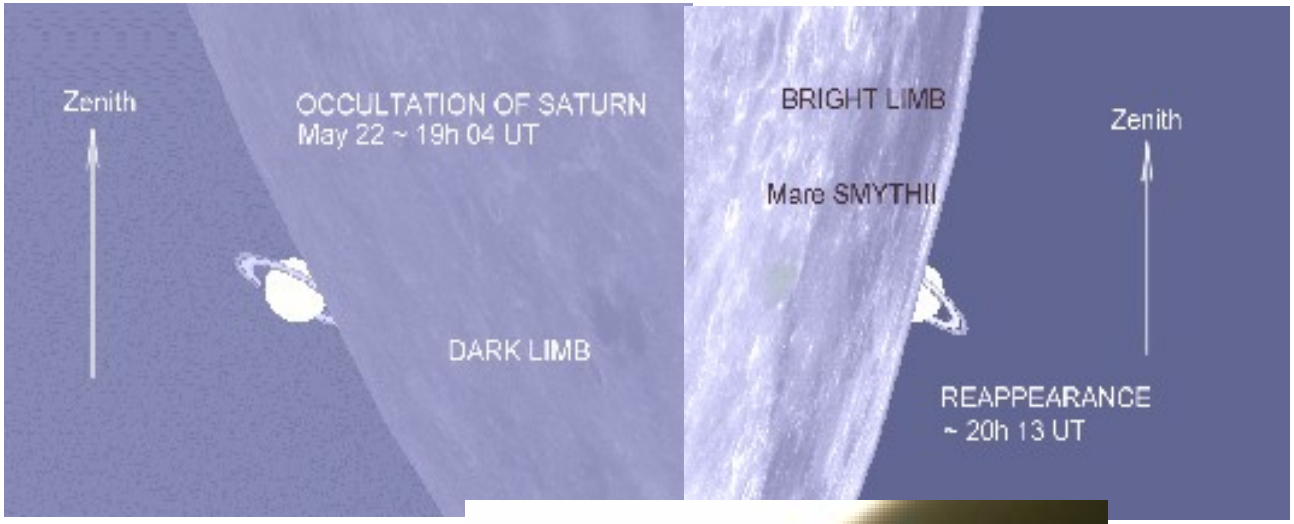
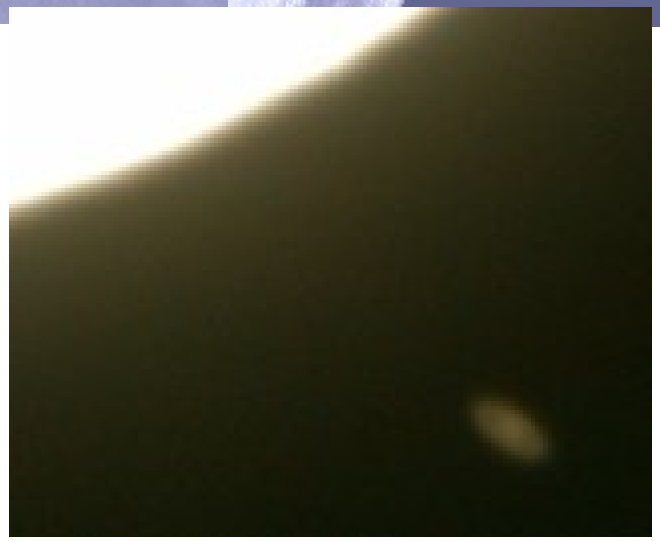
- **Broadcasting:** May 22nd, 2007 Hiding of Saturn by the Moon





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- ✓ **Broadcasting:** March 3rd, 2007 & February 20th, 2008.
  Life broadcasting of Total Moon Eclipse

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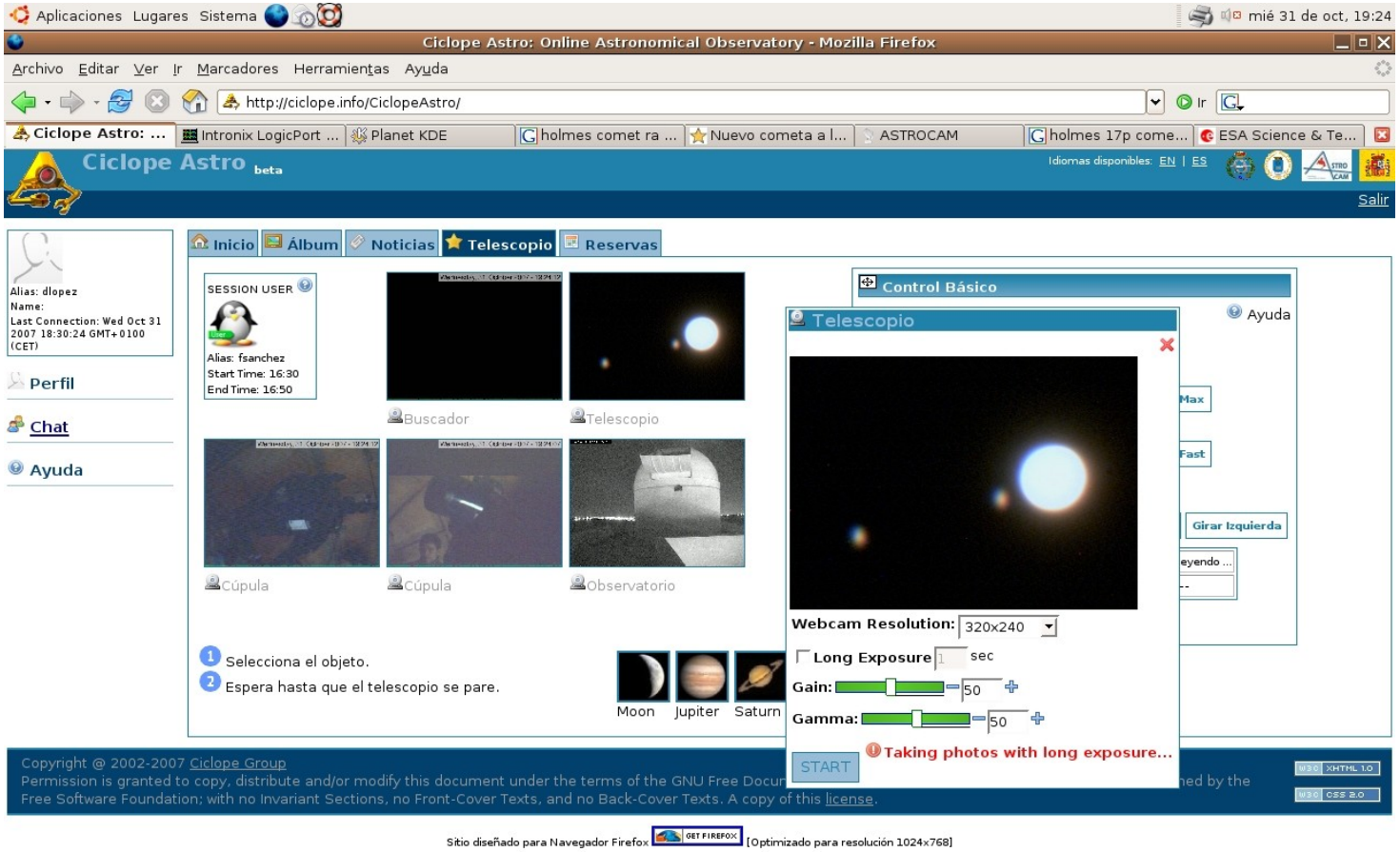
Montegancedo Observatory

http://om.fi.upm.es

- **Event:** February 15th, 2008 (21:00h). Public dissemination activity in CosmoCaixa Madrid



Ciclope Astro: Online Astronomical Observatory - Iceweasel

File Edit View History Bookmarks Tools Help

http://ciclope.info/Black/?locale=en

Google

Getting Started Latest Headlines

Ciclope Astro beta

Available Languages: EN | ES

Dome

Friday, 15. February 2008 - 22:03:14

Webcam Resolution: 320x240

Long Exposure: 0 sec Grid

Gain: -1

Exposure: 1

START STOP APPLY

nmunity Telescope Chat

Finder (Long Exp.)

Telescope (Long Exp.)

Finder (Long Exp.)

21:03:13 2008/02/15

Observatory

EC: +26*27. Slew is Possible

Moon Mars M 42 M 45 NGC 884 NGC 869 Saturn

Basic Control

Help

Telescope Status: Stop

Speed:

Guide Center Find Max

Focus:

Fine Slow Medium Fast

Dome Status: Stop

Dome: Open Close Stop Step by step

Turn Left Turn Right Turn Stop Step by step

RA:	04:54:56	DEC:	-15ß28:56
Local Time	19:05:14	Left Time	---

Update

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Transferring data from catalejo.datsi.fi.upm.es...

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File Edit View History Bookmarks Tools Help

http://ciclope.info/Black/?locale=en

Getting Started Latest Headlines

Ciclope Astro beta

Available Languages: EN | ES

Alias: dlopez
Name:
Last Connection: 15/02/2008 18:20:40

My Profile

Home | News | Community | Telescope | Chat

SESSION USER
Reservation Free!

Finder (Long Exp.)

Telescope (Long Exp.)

Dome

Finder (Long Exp.)

Observatory

1 Select the object target.
2 Wait until telescope stops.
Target: RA: 05:40.1 DEC: +26*27. Slew is Possible

Moon

Mars

M 42

M 45

NGC 884

NGC 869

Saturn

Finder (Long Exp.)

Webcam Resolution: 320x240

Long Exposure: 10 sec Grid

Gain: -1

Exposure: -1

START STOP APPLY

Taking photos with long exposure mode: '10' seconds. Wait Count new image!!!

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Transferring data from gayuba1.datsi.fi.upm.es...

Ciclope Astro: Online Astronomical Observatory - Iceweasel

File Edit View History Bookmarks Tools Help

http://ciclope.info/Black/?locale=en

Getting Started Latest Headlines

Ciclope Astro beta

Available Languages: EN | ES

Alias: dlopez
Name:
Last Connection: 15/02/2008 18:20:40

My Profile

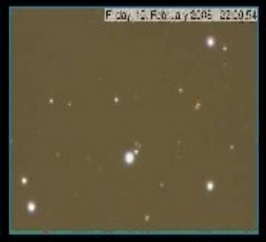
Home News Community Telescope Chat

SESSION USER
Reservation Free!

Finder (Long Exp.)

Telescope (Long Exp.)

Dome


Finder (Long Exp.)

Observatory

1 Select the object target.
2 Wait until telescope stops.
Target: RA: 05:40.1 DEC: +26*27. Slew is Possible

Moon

Mars

M 42

M 45

NGC 884

NGC 869

Saturn

Dome

Webcam Resolution: 320x240

Long Exposure: 0 sec Grid

Gain: -1

Exposure: 1

START STOP APPLY

Help

Max

Fast

Step by step

Step by step

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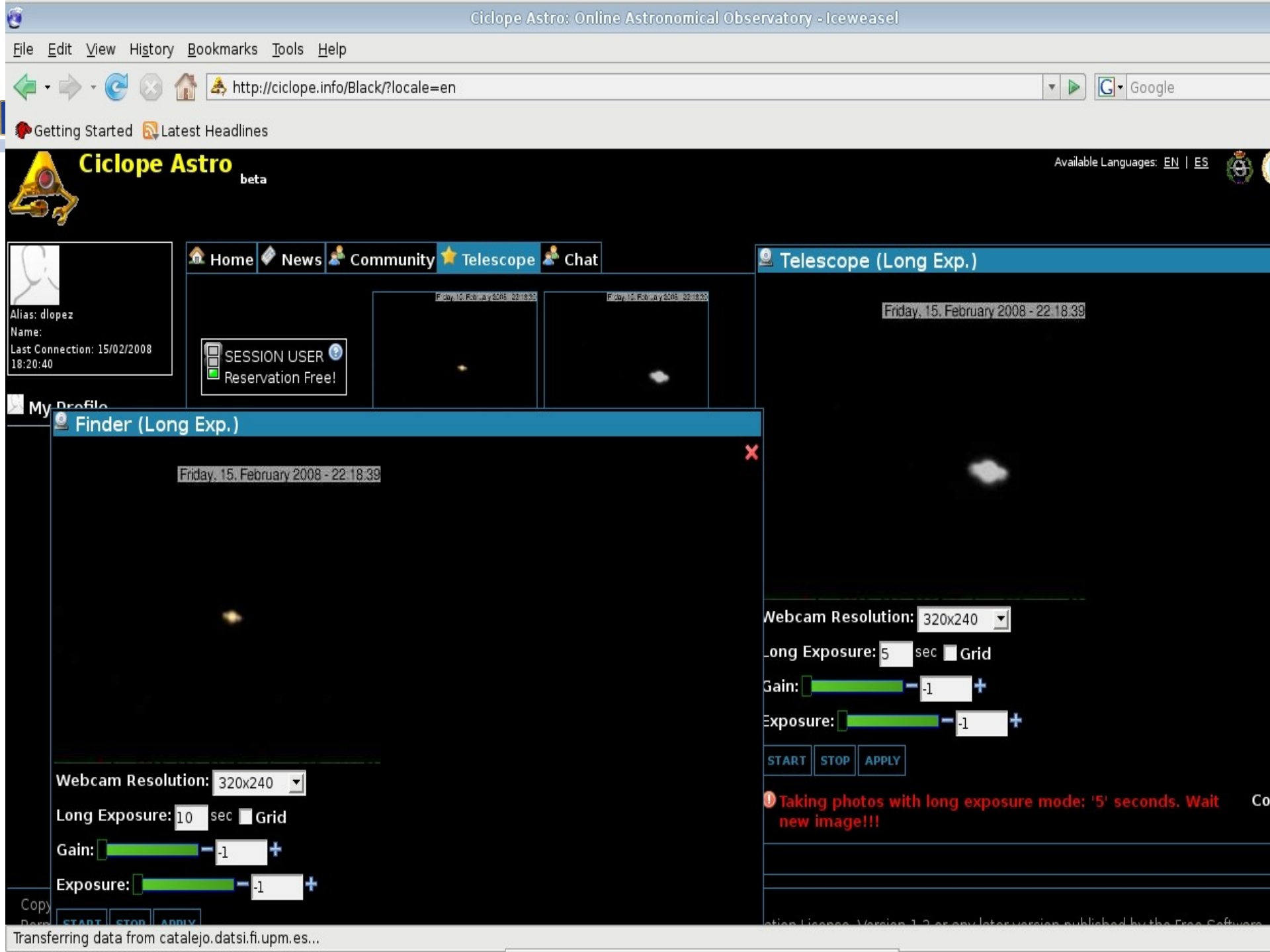
Transferring data from catalejo.datsi.fi.upm.es...


Ciclope Astro: Online Astronomical Observatory - Iceweasel
File Edit View History Bookmarks Tools Help
http://ciclope.info/Black/?locale=en
Google
Getting Started
Latest Headlines
Ciclope Astro
beta
Available Languages: EN | ES
Alias: dlopez
Name:
Last Connection: 15/02/2008 18:20:40
Home
News
Community
Telescope
Chat
SESSION USER
Reservation Free!
Telescope (Long Exp.)
Friday, 15. February 2008 - 22:18:39
Webcam Resolution: 320x240
Long Exposure: 5 sec Grid
Gain: -1
Exposure: -1
START
STOP
APPLY
Taking photos with long exposure mode: '5' seconds. Wait new image!!!
Finder (Long Exp.)
Friday, 15. February 2008 - 22:18:39
Webcam Resolution: 320x240
Long Exposure: 10 sec Grid
Gain: -1
Exposure: -1
Transferring data from catalejo.datsi.fi.upm.es...

- July 11th, 2008 (21:00h). Dissemination activity in CosmoCaixa Madrid: *The stormy pass of the solar system*

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http://www.ciclope.info/CiclopeAstro/?locale=es

Página de inicio de Mozilla Firefox | Ciclope Astro: Online Astronomic...

Ciclope Astro beta

Idiomas disponibles: EN | ES

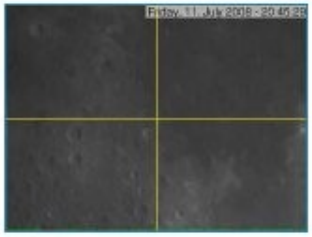
Salir

Alias: fsanchez
Name: Paco
Last Connection: 11/07/2008 19:53:42

Mi Perfil

Inicio | Noticias | Comunidad | Telescopio | Chat

USUARIO SESIÓN
Reserva Libre



Buscador (Larga Exp.)

Telescopio (Larga Exp.)

Cúpula

Buscador (Larga Exp.)

Observatorio

1. Selecciona el objeto.
2. Espera hasta que el telescopio se pare.

Luna

Marte

M 42

M 45

NGC 884

NGC 869

Saturno

Control Básico

Ayuda

Estado Telescopio: Parado

Velocidad: Guide | Center | Find | Max

Enfoque: Fine | Slow | Medium | Fast

Estado Cúpula: Parada

Cúpula: Abrir | Cerrar | Parar — Paso a paso

Giro Izda | Giro Dcha | Giro Parar — Paso a paso

RA:	Leyendo ...	DEC:	Leyendo ...
Hora Local:	Leyendo ...	Tiempo Restante:	---

Actualizar

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W3C XHTML 1.0
W3C CSS 2.0

Sitio diseñado para Navegador Firefox GET FIREFOX [Optimizado para resolución 1024x768]

Ciclope Astro beta

Idiomas disponibles: EN | ES

Salir

Buscador (Larga Exp.)

Resolución Webcam: 640x480

Larga exposición: 0 seg ☐ **Rejilla**

Ganancia: -1

Exposición: -1

COMENZAR | PARAR | APLICAR

Control Básico

Ayuda

Estado Telescopio: Parado

Velocidad: Guide | Center | Find | Max

Enfoque: Fine | Slow | Medium | Fast

Estado Cúpula: Parada

Cúpula: Abrir | Cerrar | Parar ☐ **Paso a paso**

Giro Izda | Giro Dcha | Giro Parar ☐ **Paso a paso**

RA:	Leyendo ...	DEC:	Leyendo ...
Hora Local:	Leyendo ...	Tiempo Restante:	---

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W3C XHTML 1.0
W3C CSS 2.0

solución 1024x768]

Ciclope Astro beta

Idiomas disponibles: EN | ES

Salir

Buscador (Larga Exp.)

Resolución Webcam: 640x480

Larga exposición: 0 seg ☐ **Rejilla**

Ganancia: -1

Exposición: -1

COMENZAR | PARAR | APLICAR

Control Básico

Ayuda

Estado Telescopio: Parado

Velocidad: Guide | Center | Find | Max

Enfoque: Fine | Slow | Medium | Fast

Estado Cúpula: Parada

Cúpula: Abrir | Cerrar | Parar ☐ **Paso a paso**

Giro Izda | Giro Dcha | Giro Parar ☐ **Paso a paso**

RA:	Leyendo ...	DEC:	Leyendo ...
Hora Local:	Leyendo ...	Tiempo Restante:	---

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W3C XHTML 1.0
W3C CSS 2.0

solución 1024x768]

Ciclope Astro beta

Idiomas disponibles: EN | ES

Salir

Buscador (Larga Exp.)

Resolución Webcam: 640x480

Larga exposición: 0 seg ☐ **Rejilla**

Ganancia: -1

Exposición: -1

COMENZAR | PARAR | APLICAR

Control Básico

Ayuda

Estado Telescopio: Parado

Velocidad: Guide | Center | Find | Max

Enfoque: Fine | Slow | Medium | Fast

Estado Cúpula: Parada

Cúpula: Abrir | Cerrar | Parar ☐ **Paso a paso**

Giro Izda | Giro Dcha | Giro Parar ☐ **Paso a paso**

RA:	Leyendo ...	DEC:	Leyendo ...
Hora Local:	Leyendo ...	Tiempo Restante:	---

Actualizar

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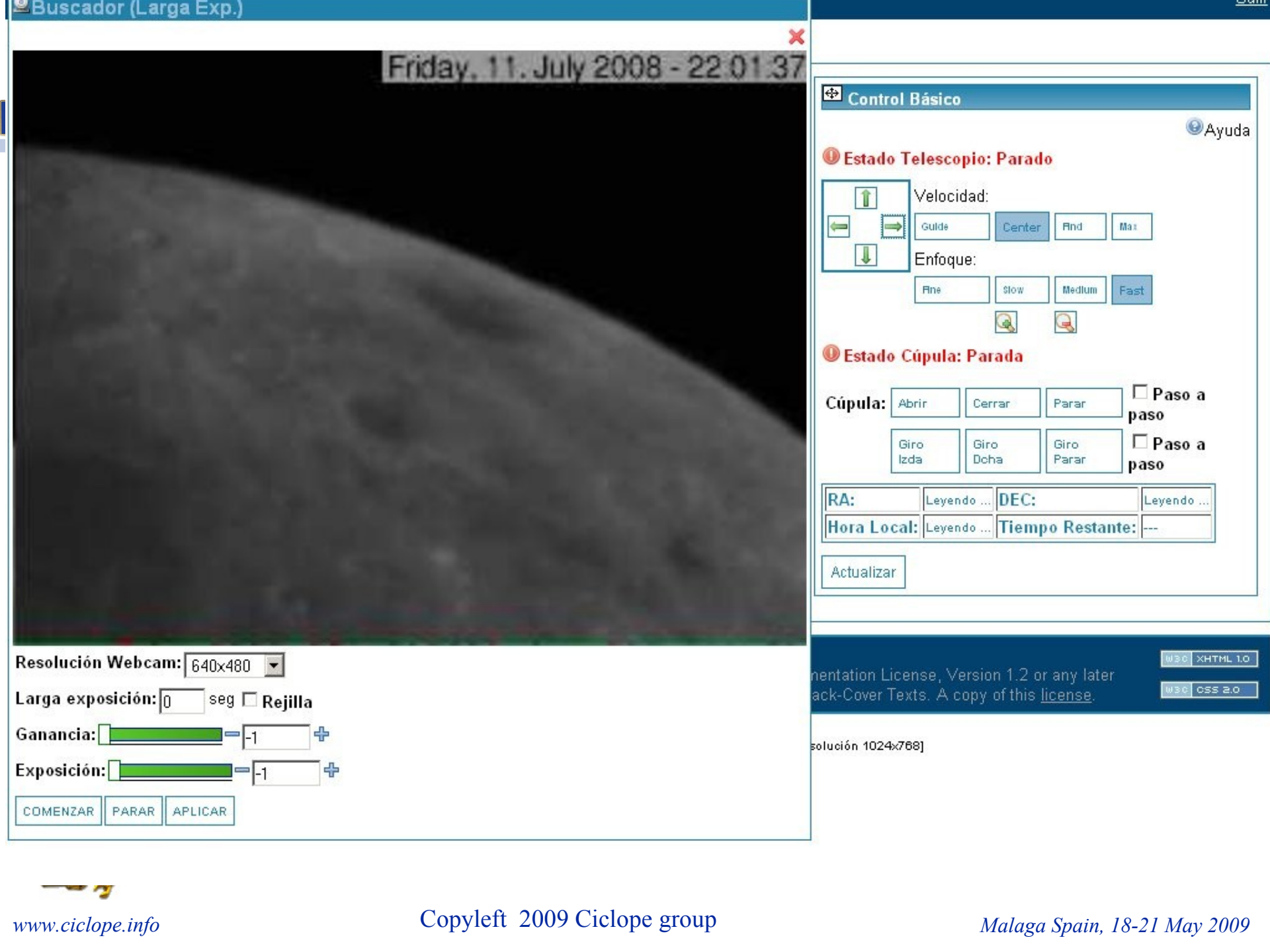
W3C XHTML 1.0
W3C CSS 2.0

solución 1024x768]



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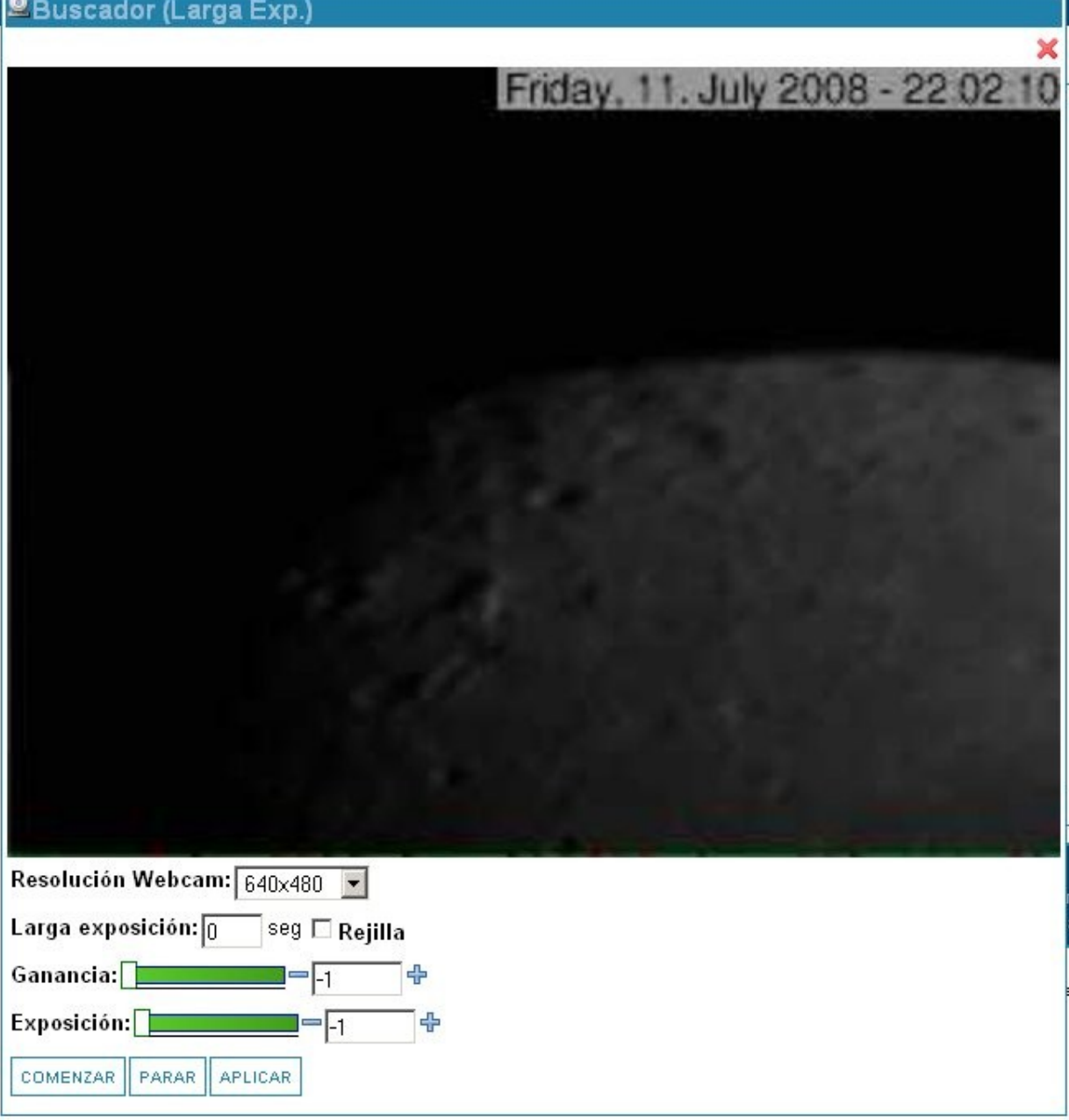

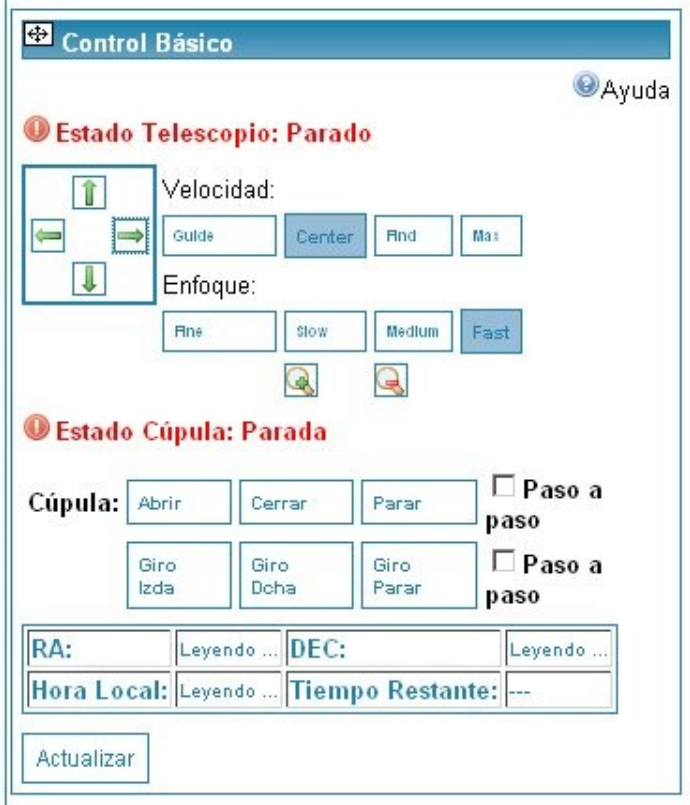

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XHTML 1.0
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Retransmisión Eclipse de Sol

1 Agosto de 2008

Shelios.com

Shelios 2008
Expedición a Novosibirsk
Eclipse Total de Sol

Astrofísica Comunidad de Madrid

Expedición a Novosibirsk (Rusia)

	Tiempo Universal	Madrid (TU+2)	Novosibirsk (TU+7)
1º CONTACTO	9:41:19	11:41:19	16:41:19
2º CONTACTO	10:43:52	12:43:52	17:43:52
3º CONTACTO	10:46:11	12:46:11	10:46:11
4º CONTACTO	11:45:04	13:45:04	11:45:04

Patrocinan

CajaCanarias

@laRed Soluciones Web

CeSViMa

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EL PAÍS.com Sociedad
Viernes, 1/8/2008, 17:00 h

Colapso en la web de la UPM durante la retransmisión en directo del eclipse

Cerca de un millón de internautas trataron de conectarse sin éxito a la página de la universidad

EUROPA PRESS / ELPAÍS.com - Madrid - 01/08/2008

Vota ☆☆☆☆☆ | Resultado ★★★★½ 24 votos

Cerca de un millón de conexiones han colapsado el servidor del Centro de Supercomputación y Visualización de la Universidad Politécnica de Madrid (UPM) desde que el que se iba a retransmitir en directo vía Internet el eclipse total que ha oscurecido el disco solar en el Ártico, Siberia y China, según han informado fuentes del grupo de investigación Cíclope. Los lectores del ELPAÍS.com sí han podido seguir la retransmisión a través de la página de NASA TV, el canal público de televisión *online* de la Administración espacial de EE UU.

NASA
(Administración Nacional de la Aeronáutica y del Espacio)
A FONDO
Sede: Washington, D.C. (Estados Unidos)

Al entrar en la página eclipse.cesvima.upm.es los internautas han encontrado el mensaje "forbidden" (prohibido en español). Fuentes de Cíclope han asegurado que los problemas no se

Momento cumbre de este fenómeno que no se volverá a repetir hasta 2026. - NASA

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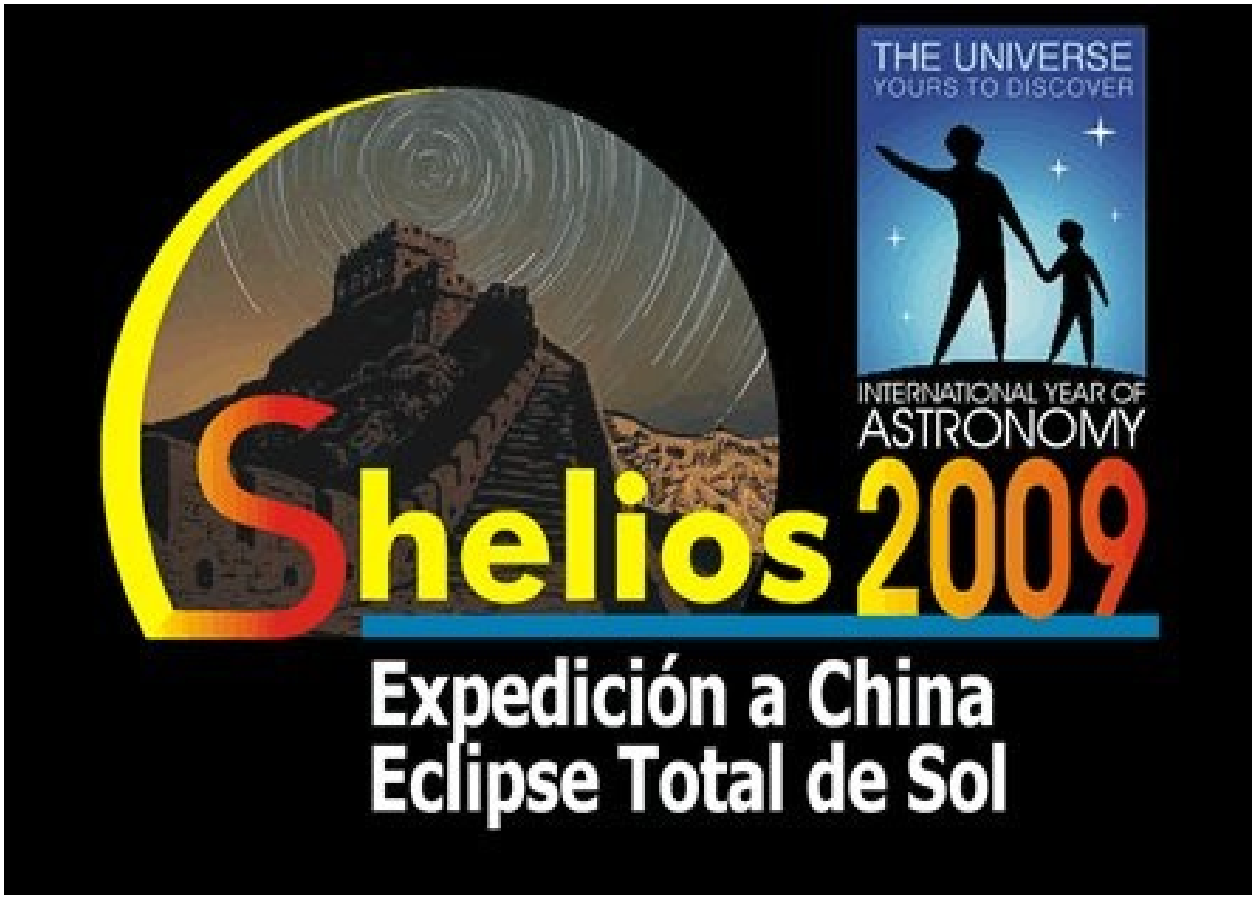
- Sun Eclipse July 22nd, 2009 China
  - P2P technology (plug-in for Mozilla Firefox)



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5. Free observation in Montegancedo Observatory

Current Observation:

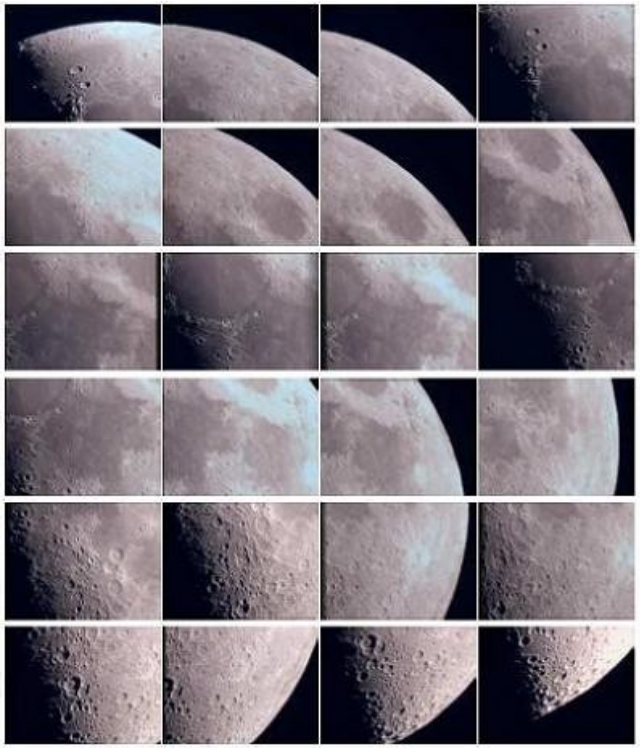
- ✓ Sun H-alfa

Next Observation:

- ✓ Moon observation and mosaic generation

Future Observation

- ✓ Planets observation
- ✓ Measure of distance to stars



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Montegancedo Observatory

Montegancedo Astronomical Observatory - Mozilla Firefox

Archivo Editar Ver Historial Marcadores Herramientas Ayuda

http://om.fi.upm.es/CiclopeAstro/?locale=en

Jornadas de Automática » universidad ... | Montegancedo Astronomical Obs...

Powered by Ciclope Astro beta

Available Languages: EN | ES

Forgot your password? Username: Password: Sign in Register!

Home | Public Telescope | Album | Chose a name! | Reservations | News | Community

- Home
- Observatory
- Screenshots
- Financing
- Contact us
- Wiki

Server Time: 07:11 UTC

Welcome to Montegancedo Observatory!

This is the first free access astronomical observatory of the world, made by the "Collaborative Learning Group" Ciclope.

The **aim** is to build up a **community** who learn Astronomy and, why not? maybe discover new something.

We would like to make the 100% of the timetable. It will be extended it, adding new experiments and observations to other celestial objects.

The Access Conditions will be changed to make the most of full time. We will try to please to the beginner and the advanced user. It is not an easy task! Please, be understanding.

All the content made by the community will be public, under "copyleft" licenses.

Visit the control interface and see what is happening now in the Observatory.

Click here!

Webcam on UPM Observatory
(updated each 20 seconds)

Horario apertura:
Lunes a Viernes de 7:00 - 16:00 (UTC).

Estado de la cúpula: CERRADA

¡Novedad! Concurso fotográfico
Sube tu foto de la Estación Espacial Internacional y participa en el concurso.

¡Nuevo! ¡Entra y CHATEA!

07:11:10, 05/21/09 UTC

Temperature	19.6 C
Wind Chill	19.6 C
HeatIndex	19.6 C
Humidity	52 %
Dewpoint	9.4 C
Barometer	1010.0 mb
Wind	ENE at 0 kph
Rain Today	0.0 mm
Rain Rate	0.0 mm
Sunrise	04:54 UTC
Sunset	19:31 UTC
Moon phase	Waning 13% Full
Prediction	Increasing clouds with little temperature change.

(Updated every minute)

Data obtained from Ciclope Weather!

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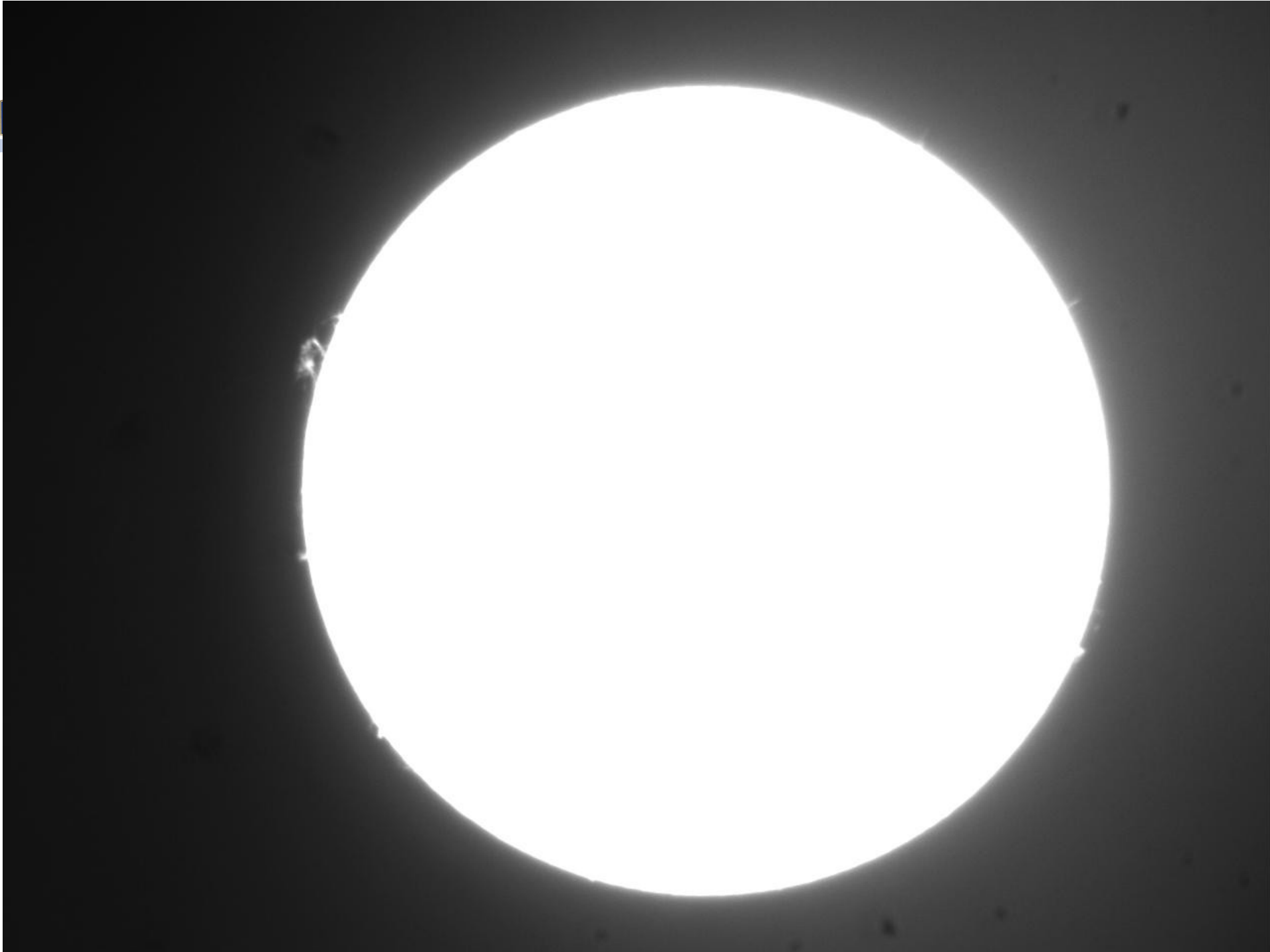
Legal Information | Privacy Policy | Conditions of Use | Access Conditions to the Observatory Montegancedo

Website designed for Firefox Browser [Optimized for 1024x768 resolution]

W3C XHTML 1.0 W3C CSS 2.0

Terminado



EL PAIS.com

yo periodista

ELPAIS.com > Yo, periodista

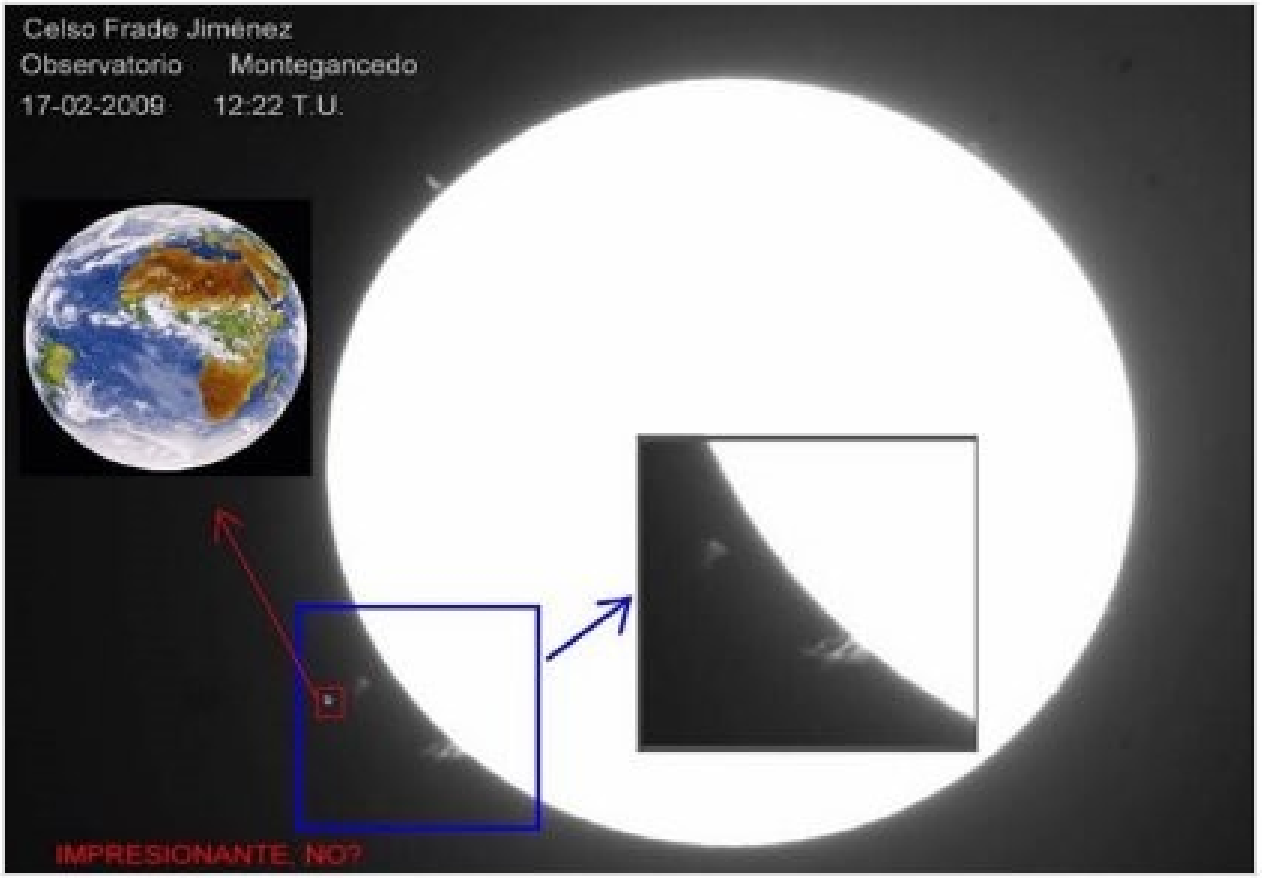
Yo, CELSO FRADE

Observatorio en el aula

El primer observatorio astronómico del mundo gratuito acaba de ser inagurado en Madrid

CELSO FRADE - Madrid - 19/02/2009

Vota ☆☆☆☆☆ | Resultado ★★★★½ 64 votos



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Ciclope Astro: Online Astronomical Observatory - Mozilla Firefox

Archivo Editar Ver Historial Marcadores Herramientas Ayuda

http://gayuba5.datsi.fi.upm.es:8080/TAD/?locale=es

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Página de inicio de ... | Ciclope - Sitio web ... | FKFT: Ciclope Astro | FKFT: | Call for Papers | Fr... | Ciclope Astro: O...

TAD: Telescopio Abierto Divulgación

Powered by Ciclope Astro

Username: Password: Entrar Regístrate!

- Inicio
- Componentes
- Recursos Didácticos
- Manuales
- Pantallazos
- Licencia
- Contactar

Inicio | Reservas

¿Qué es el TAD?

El TAD es un telescopio controlado remotamente a través de Internet usando un simple navegador web. Los alumnos, usando una simple conexión a Internet podrán dirigir, con la ayuda de un docente y Unidades Didácticas ya existentes (ver www.Astroaula.net menú de Recursos Didácticos), un proyecto de observación astronómica real.

El TAD está instalado en el Observatorio del Teide (Instituto de Astrofísica de Canarias, Tenerife).

¡¡Ya es posible reservar noches de observación en el telescopio!!

Webcam en el Observatorio del Teide
(actualizada cada 5 segundos)

INSTITUTO DE ASTROFISICA DE CANARIAS · IAC

FECYT

AÑO de la CIENCIA 2007

MINISTERIO DE CIENCIA E INNOVACIÓN

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Sitio diseñado para Navegador Firefox GET FIREFOX [Optimizado para resolución 1024x768]

W3C XHTML 1.0 W3C CSS 2.0

Terminado

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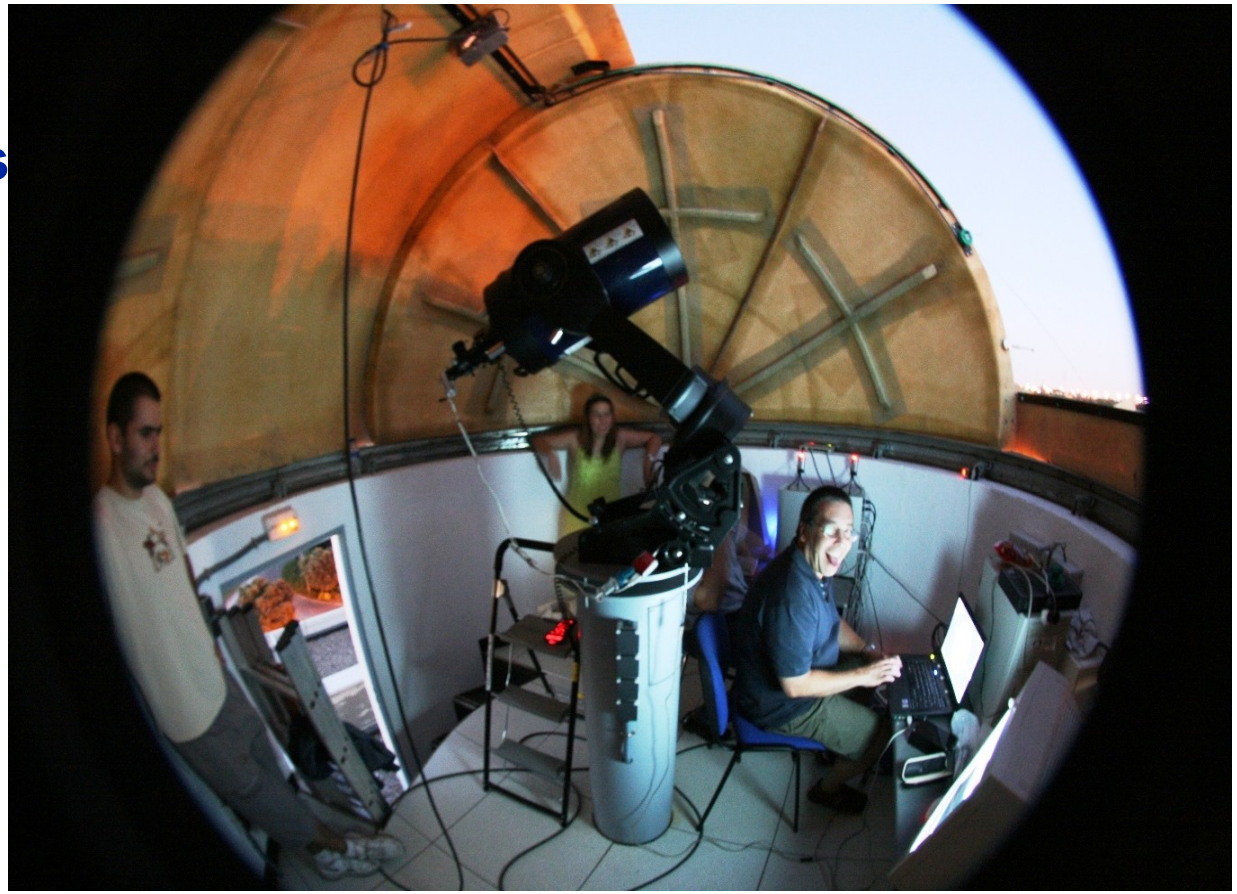
6. Future work

Network of telescopes for educational purposes and Citizen Science

- ✓ Asteroids tracking
- ✓ PHAs & NEOs
- ✓ Spatial debris
- ✓ Hexoplanets
- ✓ GRB's



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7. Conclusions

- FOSS Architecture (Free Open Source Software) for the teleoperation of remote remote
- Easily adapted to any new piece of hardware
- Web 2.0, we offers tools and methodology for on-line learning
- All the knowledge is made by the community
- Documentation and software available in the project site
  http://www.ciclope.info
  - http://sourceforge.net/projects/castro/
  -

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7. Acknowledge

This project is partially funded by

- ✓ **Comunidad de Madrid** with the project **ASTROCAM:** Astrophisical Network of Madrid (S-0505-ESP-0237)
  - www.astrocam.es
  - www.madrid.org
- ✓ Previous finance
  - www.ciclope.info/finance_es

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Workshop on Robotic Autonomous Observatories
Torremolinos, Malaga, Spain, 18-21 May 2009

Montegancedo Observatory: The First Free Access Astronomical Observatory Teleoperated Via the Internet

http://om.fi.upm.es

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