

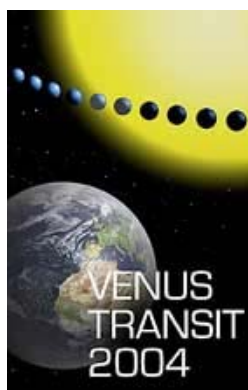
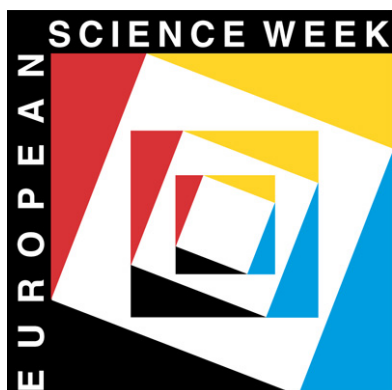
QuickTime™ and a
decompressor
are needed to see this picture.

Project no.: SAS6-CT-2003-508963
Project acronym: VENUS TRANSIT 2004

Project title: **VENUS TRANSIT IN JUNE 2004: EXOPLANETS AND THE
SIZE OF THE WORLD**

Instrument: Specific Support Action
Science and Society – European Week of Science and Technology

PUBLISHABLE FINAL ACTIVITY REPORT



Period covered:
1 January 2004-31 December 2004
Start date of project:
1 January 2004
Duration:
12 months

Project coordinator name:
Dr Richard West*
Project coordinator organisation
name: ESO
Revision 1.0

** This report was prepared by Claus Madsen, following the retirement of Dr Richard West*

The Venus Transit 2004 Science Discovery Programme (VT-2004)

Summary by Claus Madsen (ESO), based on reports by Richard West (ESO) and Henri Boffin (ESO).

On June 8, 2004 the planet Venus passed in front of the Sun. This event was rare since the last one occurred in 1882, and so, no living person had seen it. Only four such events happen within a period of 243 years. Other Solar System objects also pass in front of the Sun, such as the Moon during solar eclipses, and Mercury. The transits of planets in front of the Sun have been involved in fundamental steps of the history of Astronomy and of the history of Sciences. This Venus transit was easy to observe, provided that, as required for solar eclipses, safety measures are taken when observing the Sun. This event provided an exceptional opportunity to have a wide pedagogic action in connection with a very rich historical background. Hence this project in the field of Astronomy used the exceptional opportunity of this 2004 Venus transit in front of the Sun to introduce different scientific concepts to a very large and various public: measurement of distances in the Universe, structure of the Solar System and planetary motions, parallax effects, steps of a scientific measurement and its inherent uncertainties, and the search for extra-solar planets.

The project involved a large international network composed of teachers, students, high school pupils, amateur astronomers, and a more general public. Participants could undertake themselves a real measurement of a fundamental astronomical value, the Astronomical Unit, thanks to the timing of this event, and compare their own observational data with the theoretical ones.

The specific elements of the activity comprised:

- the coordination of a wide educational network founded on the connection between European and extra European schools;
- the preparation of the teachers who will guide the students for the observation on June 8, 2004;
- the performing, and large diffusion of scientific, observational practice and safety information in several languages : paper sheets, posters and booklets;
- the development of a web site where electronic data will be exchanged, observational data collected and real time analysis made;
- the organisation of a webcast where images from different professional sites will be shown in real time;
- the organisation of an electronic forum from which a wide public could get answers from astronomers;
- the organisation of several sites of public observation.

The VT-2004 Programme was divided into four main phases:

- **Autumn 2003:** contacts with the schools and teachers, diffusion of the first information
- **January-June 2004:** large diffusion of information about the June event, training of the teachers and amateur astronomers to frame the observations, contacts with the media and safety recommendations, registration of observers
- **June 8:** webcast, chat room, observations from several sites and collection of data
- **Autumn 2004:** synthetic analysis and feedback towards the public, selection of contest winners and a Final Event for participants.

The particular ways for the public to interact with the programme comprised:

- Participating in the measurements on the day of the VT-2004 (possibly the largest public scientific experiment ever undertaken)
- Sending drawings and photos to the website (contest)
- Participating in the video-contest
or
- Simply following the event web-cast

Information sheets were prepared for observers, school classes etc.

Organisation

The partners behind VT-2004 were the European Southern Observatory (ESO), the European Association for Astronomy Education (EAAE), the Institut de Mécanique Céleste et de Calcul des Éphémérides (IMCCE)/the Observatoire de Paris in France, as well as the Astronomical Institute of the Academy of Sciences of the Czech Republic.



The programme was overseen by an International Steering Committee, with representatives of the above partners, assisted by a programme coordinator. An independent, international jury of experts assessed the contributions submitted for the contests. The programme was executed with the help of national partners in the following countries:

VT-2004 Network Members in Europe

Albania	Andorra
Austria	Belarus
Belgium	Bosnia and Herzegovina
Bulgaria	Croatia
Cyprus	Czech Republic
Denmark	Estonia

Finland	France
Germany	Greece
Hungary	Iceland
Ireland	Italy
Latvia	Liechtenstein
Lithuania	Luxembourg
Macedonia, The Former Yugoslav Republic of	Malta
Moldova	Monaco
Netherlands	Norway
Poland	Portugal
Romania	Russia
San Marino	Slovakia
Slovenia	Spain
Sweden	Switzerland
Turkey	Ukraine
United Kingdom	Vatican City
Yugoslavia (Serbia and Montenegro)	

VT-2004 Network Members outside Europe

Algeria	Australia
Brasil	Canada
Egypt	India
Japan	Mexico
New Zealand	P.R.China
Russia	Sri Lanka
Thailand	United States of America
Uruguay	Venezuela

Dissemination

Information about and preparation for the VT-2004 Programme was organised around:

- 3 Preparatory Meetings for teachers (meeting on 23-25 January 2004 in Mondorf-les-bains in Luxembourg), for the Media (Meeting on 15 March 2004 at the ESO Headquarters in Garching near Munich) and for amateur astronomers, meeting in Brandys, CZ, 7 May 2004);
- A preparatory meeting for National Nodes at the ESO Headquarters in Garching near Munich on 17 April 2004;
- The Final Event in Paris on 5-7 November 2004;
- A comprehensive web site (<http://www.eso.org/public/outreach/eduoff/vt-2004/index.html>), which served as the backbone for the entire programme;
- A series of press releases, issued by ESO. The press releases also included broadcast-quality video footage including high-end animations for TV.

- A book (Le Passage de Vénus) and a CD-Rom, published by the IMCCE and available from their website at URL <http://livres.edpsciences.org/ouvrage.php?ISBN=2-86883-731-X> and <http://www.imcce.fr/vt2004/fr/doc.html> respectively.

Almost all of the national nodes established native-language websites with additional country-specific information. Some examples are shown below.



The VT-2004 programme was introduced in ESO Press Release 03/04 (16 February 2004).

Further press communications were issued, jointly with the programme partners:

- VT-2004 Press Communication 01 (April 21, 2004)
- VT-2004 Press Communication 02 (April 30, 2004)
- VT-2004 Press Communication 03 (May 10, 2004)
- VT-2004 Press Communication 04 (May 21, 2004)
- VT-2004 Press Communication 05 (June 1, 2004)
- VT-2004 Press Communication 06 (June 7, 2004)
- VT-2004 Press Communication 07 (June 21, 2004)

A summarizing communication, ESO Press Release 26/04, was issued on November 2, 2004.

Apart from the photos, videos, drawings, and writing galleries, the VT-2004 web site, which is continuously maintained, is a wonderful “memory” bank on the Venus Transit which will serve for many years to come. Information and Educational sheets, Teachers “Cookbook”, and “Guidelines for Observers” are but a few example of the rich material available. It is a goldmine for educators, students, enthusiasts, or just the curious... There is also a special section for youngsters.

In addition, teachers and pupils can now recreate this experience by making virtual measurements and selecting images of the transit from a huge database. This is a unique educational tool.

EUROPEAN SOUTHERN OBSERVATORY
ESO: Astronomy made in Europe

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The Venus Transit 2004

Last update: 2004 Jun 07 21:32 CEST
(this page refreshes automatically)

quick links: [weather](#) - [forum](#) - [nodes](#) - [video](#) - [participate](#) - [observers](#) - [links](#) - [archive](#)

VT-2004 No. of registered participants:	1985
No. of observers with timings:	0
No. of timings sent:	0
Official value of 1 AU:	149597870 km
Calculated AU:	0 km
Dispersion:	0.0 km
Absolute Difference:	-149597870 km
Difference as percentage:	100.000 %

[more \(with graphics\)](#)

OBSERVERS

SST - Swedish 1m Solar Telescope
June 7 12:53 UT
La Palma, (Spain)

Test image of the Sun
June 7, 14:00 UT
14 inch Cassegrain
AGARIS - ESO HQ
(Garching, Germany)

SOHO LASCO - C2 (ESA)

Latest Comment (June 8, 01:30 UT): The DAY OF THE TRANSIT has begun - the VT-2004 team is here to accompany you through this unique experience! Soon we will begin to display images of the Sun taken this morning by professional telescopes. This image taken 12 hours ago with the Swedish Solar Telescope (SST) on Tenerife (left) shows the so-called "granulation", cells of hot gas (hundreds of kilometres across) moving around near the visible "surface" of the Sun. The dark feature in the lower part of that image is a "sunspot", a region somewhat cooler than the surroundings. Venus is now very close to the Sun in the C2 image from SOHO LASCO (right), approaching it from the left. A test photo of the Sun (middle) was obtained by the ESO amateur astronomers (AGARIS) in the afternoon on June 7.

While you are preparing for today's event, why don't you get into the right mood by listening to John Philip Sousa's "Venus Transit March" from 1892?

last modified: 2004/06/07

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VT-2004 → AU CALCULATION

Calculate yourself the AU using Delisle's method

On this page you are able to access the VT-2004 timings database to perform Delisle's method (2 sites of observation). You will have to choose the geographic coordinates (longitude, latitude) of the first observing site. You will get a list of geographic coordinates of sites with the corresponding data. After choosing the first site, the software will automatically select the secondary sites with which Delisle's method will provide a value for the AU.

D Choose a geographic area for the first site (or modify it)

First, you have to choose a geographical area (indicate the coordinates) and a contact in the form below.

Longitude: East Latitude: North

T1: ☐ T2: ☐ T3: ☐ T4: ☐

[How to know and enter your coordinates?](#)

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Nail (6 years)
(Neupercht, Germany)

Yule (8 years)
(Neupercht, Germany)

Pandora (3 1/2 years)
(Munich, Germany)

Sam (6 years)
(Anderlus, Belgium)

Vassila (8 years)
(Thessaloniki, Greece)

Stefania (8 years)
(Thessaloniki, Greece)

Kyriaki (8 years)
(Thessaloniki, Greece)

Kostantinos (8 years)
(Thessaloniki, Greece)

Paul Dixon (6 years)
(Oslo, Norway)

Sorgi (4 years)
(Vienna, Austria)

Stavros (9 years)
(Karditsa, Greece)

David (8 years)
(Vienna, Austria)

Emmanouela (8 years)
(Thessaloniki, Greece)

Elektro (8 years)
(Thessaloniki, Greece)

Dimrits (8 years)
(Thessaloniki, Greece)

Alakentri (8 years)
(Thessaloniki, Greece)

Anthony (11 years)
(Mechelen, Belgium)

Gerd Edgar (8 years)
(Feldkirch, Austria)

Verna (5 years)
(Vienna, Austria)

Laurence (8 1/2 years)
(Belgium)

Hara (8 years)
(Thessaloniki, Greece)

Grace (8 years)
(Thessaloniki, Greece)

Piotr (8 years)
(Thessaloniki, Greece)

Evagelia (8 years)
(Thessaloniki, Greece)

Karol (10 years)
(Warsaw, Poland)

Participation

All in all, the organisers registered:

- 75 million webhits in total
- 55 million webhits and 1.75 Terabytes of data transferred on the day of the transit
- 6 million webhits in UK, Germany etc.
- 6 webhits in Rwanda!
- Participants in 240 'regions' on all continents (US states counted as 'regions')
- Submission to the Web Gallery of 600 photos (prizes)
- Submission to the Web Gallery of 410 childrens' drawings (prizes)
- 2763 registered observation teams registered 4550 'timings'

Final Event

On November 5-7, 2004, *the Venus Transit Experience conference* took place at the French Ministry of Research in Paris. The meeting, which was organised by the IMCCE and the Observatoire de Paris, brought together more than 150 persons connected to the VT-2004 programme. The aim was to sum up the vast experience gained through this unique public education programme and, in particular, to perform an evaluation of its many components. On the first day of the meeting, more than 50 students from the Paris areas who participated actively in this programme were also present.

At this meeting, the winners of the VT-2004 Video contest were also announced. They were:

- 1st Prize: "The Venus Transit in the Golden Valley" by Matthews Biggs, James Hendry, and Louisa Llewellyn, (Lancashire, UK).
- 2nd Prize: Venus in Sole Visa" by Martin Lhotak and Robert Smolik (Prague, Czech Republik)
- 3rd Prize: "Millenium Transit" by Piotr Majewski and Jerzy Rafalski (Torun, Poland).

The Jury, in agreement with ESO, and in recognition of the excellent quality of all three winners decided to award all three teams a trip to the ESO Observatory at Cerro Paranal in Chile.

On the second day of the conference, reports were given by experts in several areas e.g. primary and secondary schools, media, amateur astronomers, which demonstrated the imminent success of the entire effort but also served to identify some areas in which experience was gained that could become useful for future projects of this kind. The National Committees, either orally or by posters, documented in a comprehensive way the individual approaches taken in different regions and cultural environments.

On the last day of the meeting, representatives of the National Nodes met with the International Steering Committee members to discuss how to build up on the momentum gained throughout this project. Several projects for the future have been proposed and will be further explored. Everybody agreed that this meeting proved very successful and was a nice conclusion to a

unique project. Most of the presentations are available at the VT-2004 website.



Children lining up in Garching (Germany) to watch the transit of Venus on 8 June 2004. ESO Staff with VT-2004 T-shirts provide help and guidance for the young “astronomers”.