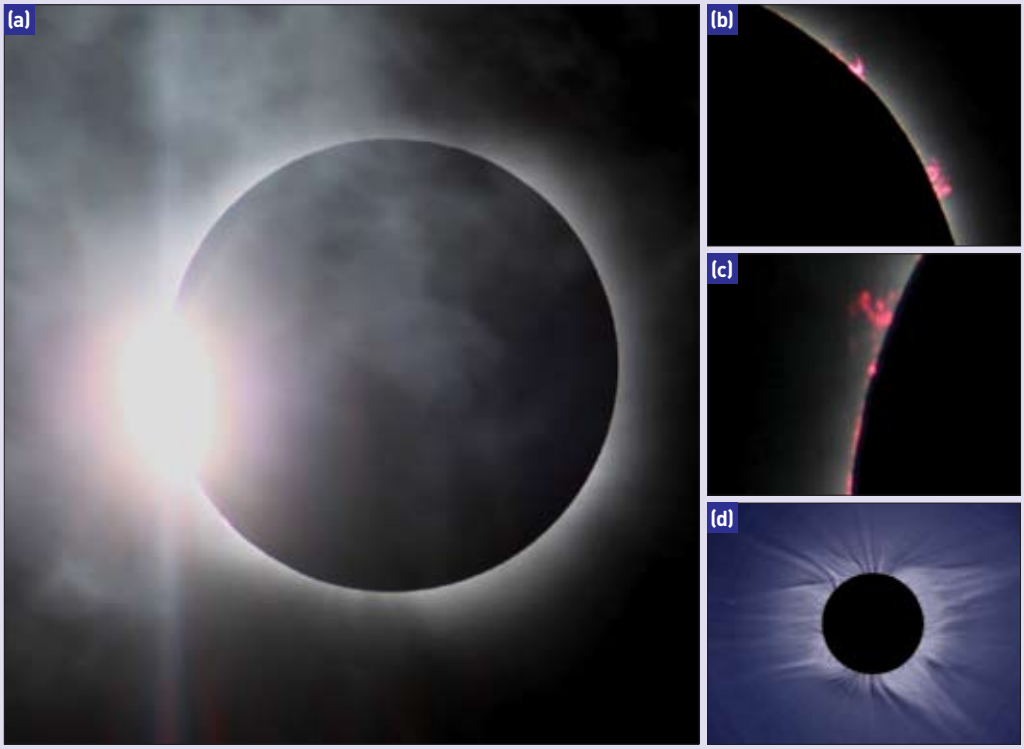
A total solar eclipse over Rapa Nui



Francisco Diego recorded spectacular images of the 11 July 2010 total solar eclipse from Rapa Nui (Easter Island), making the most of modern digital technology – much of which originated from astronomical research – in taking and processing the images.

The diamond ring (a) was seen at the start and finish of the four-and-a-half minutes of totality. At the start of totality, relatively small and faint prominences were visible (b), as is typical of eclipses around solar minimum, but a substantial prominence (c) on the west limb of the Sun, displayed a complex and dynamic structure with knots and arched jets. Image (b) also showed part of the chromosphere, narrow in this eclipse because of the relatively large Moon shadow that brought such a long period of totality. The corona (d) is still typical of periods of minimum solar activity, with a well structured global magnetic field, modulating the shape of the corona very symmetrically around the magnetic poles (top and bottom), marked by convergent "plumes" of coronal material. Processing for this image sacrificed contrast in order to show the detail of the magnetic structure. The star on the left is Delta Geminorum.

In addition to still images, Diego also recorded two high-definition videos: one of both diamond rings and the other an ultra-wide-angle view of the advance of the Moon's shadow over the landscape.

All the images are copyright Francisco Diego, but are available for outreach purposes from the website below.

http://www.ucl.ac.uk/themindofthe universe

ESA's vision

The European Space Agency has set out its priorities for the decade starting in 2015, in a report entitled Cosmic Vision.

The key questions identified by ERSA are: What are the conditions for planet formation and the emergence of life? How does the solar system work? What are the fundamental physical laws of the universe? How did the universe originate and what is it made of?

The report was based on extensive community consultation and pays attention to costs, noting that each European pays €1 per year for space, of which 80 cents go to industry in technological contracts.

http://esapub.esrin.esa.it/br/br247/br247.pdf

International team wins first Ambartsumian Prize

The first Viktor Ambartsumian International Prize, in memory of the distinguished Armenian theorist, goes to the team led by Prof. Michel Mayor of the Observatory of Geneva, for "their important contribution in the study of relation between planetary systems and their host stars".

Mayor (pictured, top), Prof. Garik Israelian (middle) of the Institute of Astrophysics in the Canary Islands (IAC), and Prof. Nuno Santos (bottom) of the Centre for Astrophysics at the University of Porto (CAUP) Portugal, received their awards in a ceremony on 18 September in Yerevan, Armenia. The Viktor Ambartsumian International Prize was instituted by the President of Armenia in 2009 and will be awarded every two years from 2010.

The prize of $500 000 is awarded to outstanding scientists of any nationality who have made a significant contribution in astrophysics and those fields of physics and mathematics which concerned Ambartsumian.

http://vaprize.sci.am

News in Brief

Thinner thermosphere

In the recent solar minimum, one layer in the Earth's upper atmosphere – the thermosphere – shrank and became about 30% less dense, something not seen in previous solar minima. Researchers monitoring satellite drag found that extreme-ultraviolet radiation levels also dropped, by 15%. Now modelling of upper atmosphere processes using the US National Center for Atmospheric Research's Thermosphere–Ionosphere–Electrodynamics General Circulation Model indicates that low ultraviolet radiation from the Sun would bring the thickness and density changes seen, reinforcing the idea that solar minima vary in nature as well as length.

http://www.ucar.edu/news

ESA funds games

ESA's Open Sky Technologies Fund, a venture capital fund that nurtures promising business opportunities arising from space technologies, has invested in start-up companies offering a navigation and communication device tailored for outdoor enthusiasts, and a live action computer game. The German TakWak GmbH is developing a robust combined satnav, mobile phone and walkie-talkie device for active sports, while Dutch-German iOpener Media matches real-time satnav data from races with online users.

http://www.esa.int/esaCP/SEMKD7209CG_index_0.html

Team finds starspots

A team led by researchers from the US National Center for Atmospheric Research has used asteroseismology – the study of acoustic vibrations within stars – to find a magnetic cycle in the star HD49933. The team has detected starspots, like sunspots, on the surface of this star, but these observations are the first to link changes in the characteristic sound waves of the star to its magnetic cycle. The sunspot cycle and magnetic field of the Sun are very closely linked, and it is hoped that this discovery, and similar data from other stars, may shed light on the magnetic processes within the Sun, and on the role of magnetic fields in the development of life in other planetary systems.

http://www.ucar.edu/news