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Cassini Scientist for a Day: an international contest in Greece

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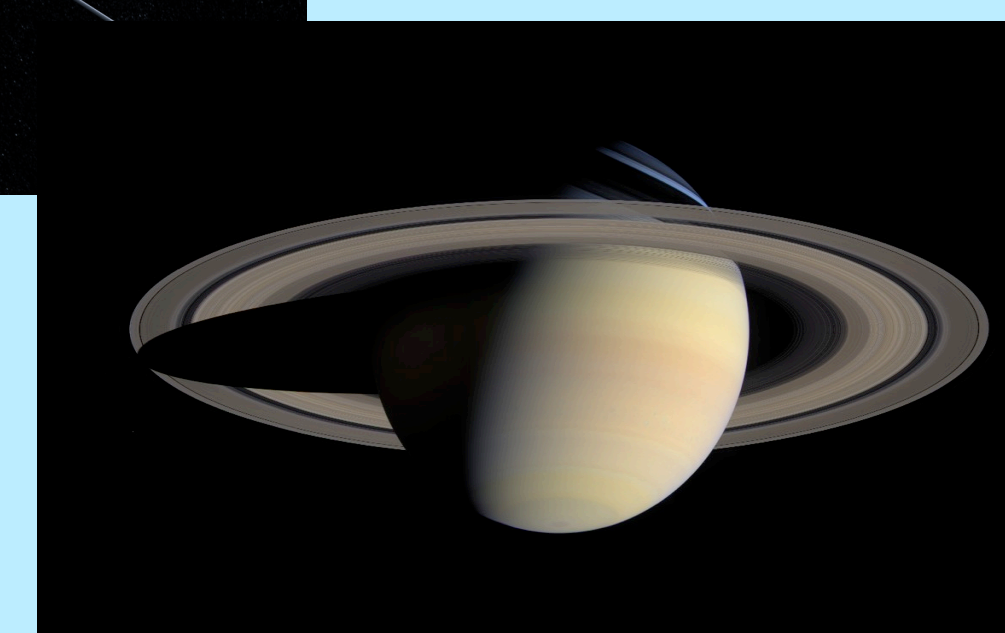
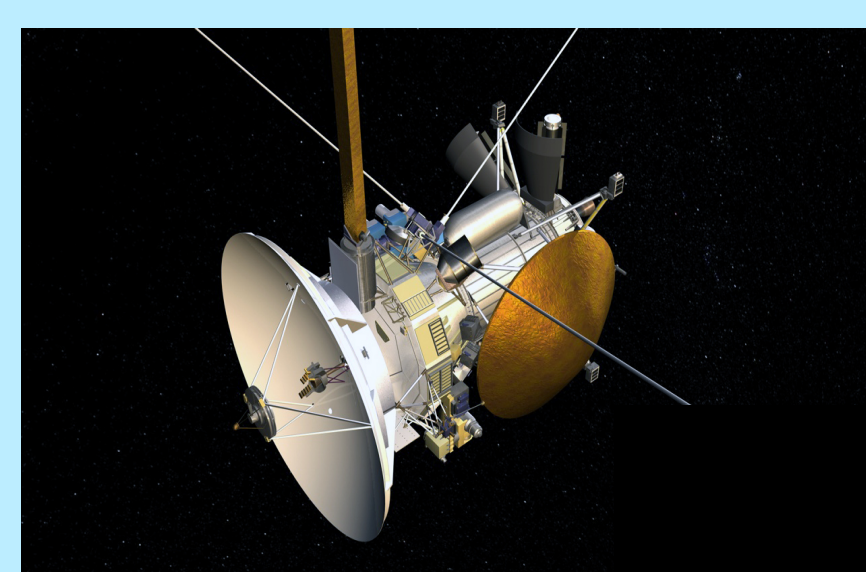
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The international contest 'Cassini Scientist for a Day', organized by the Cassini Outreach team at NASA's Jet Propulsion Laboratory, provides school students all around the world with the opportunity to get involved in astronomy and astrophysics and planetary sciences in particular. It gives excellent opportunity for outreach and publicity for the Cassini mission and ESA and NASA activities in Greece. For the years 2010 and 2011, the Space Physics Group of the Astronomy, Astrophysics and Mechanics section of the University of Athens in association with external colleagues has been selected as the co-ordinator of NASA for the competition in Greece. This kind of school competition in Greece is particularly important since Astronomy and Astrophysics and Space Sciences, although very popular, are not included in the school curricula and thus students rarely have the opportunity to experience and participate actively in these subjects. Under the guidance of Cassini Outreach team, the members of the Space Physics Group have informed, explained and spread the rules of the competition at primary, secondary and high schools all over Greece. Our members kept open communication with students, teachers and parents throughout the holding of the competition for questions and guidance.

In general, the students have the option to choose Cassini monitoring between three targets of the Saturnian system, which will bring the best scientific result. Their arguments should be summarized in an essay of 500 words more or less. They also have the option to do team work through groups of maximum three students. The participation in the contest for 2010 was unexpectedly high and thoroughly satisfied. The winners awarded through a ceremony which was held in the largest amphitheater at the central building of the University of Athens, that was fully packed. A large number of the participants of the 2010 contest are either participating in the new contest of 2011-2012 or –since some of them have graduated- are still in touch with the members of our group for study guidance. The 2012 contest has presented higher numbers of participation and interest, indicating the progress of this competition and its future involvements in school interests. This year we have organized a special ceremony, with lectures on the topic by specialists as well as some lectures by the pupil and an extra event at the Island of Salamis.



Cassini Scientist for a Day is an essay contest designed to give students a taste of life as a scientist. Students compare and research three possible targets that the Cassini spacecraft can image during a given time set aside for education. They are to choose the one observation they think will yield the best science results and explain their reasons in an essay



The 'Cassini Scientist for a day' competition in Greece for 2010, 2011...

Award ceremonies

'Cassini Scientist for a day'
school contest

University of Athens

'Ioannis Drakopoulos' amphitheater

June 17, 2011

CASSINI SCIENTIST FOR A DAY

TSIADIS ELEFTHERIOS

TARGET NUMBER 3 – A DAY ON SATURN

ESSAY

Upon trying to analyze the so called "Saturnian System", meaning Saturn, its rings and its natural satellites, information are to be gathered by Saturn itself. After all, the effects of Saturn on the system are greater than the effects of any other astronomical object of it. Specifically, Saturn's rotational period has not been assigned a standard fixed value yet. That is mainly because of different measurements made by Voyager and Cassini. Nevertheless, it is known that Saturn's period is to be smaller than 10 hours, 38 minutes and 22 seconds. As a result, using the wide angle camera Cassini spacecraft is equipped with, a direct calculation of Saturn's period becomes feasible, since the camera will capture images of Saturn for 12 hours. The greatest discrepancy between the two measurements was the period of the interior latitude of the planet, giving rise to several theories trying to explain the cause of change in value. Furthermore, the period of a planet has a great effect on several other constant physical quantities regarding that planet, some of which are related to and directly affect the Saturnian system as a whole, eg the gravitational field strength of the planet.

To start with, by learning the period of the planet, Saturn's gravitational field strength can be found. Let's consider the gravitational field strength on the surface of Saturn, expressed as the centripetal acceleration (g) experienced by an object with tangential velocity v at the surface of Saturn (at a radius R).

Where T is the period and u is the rotational velocity. Providing that the object is on the equator of Saturn, it covers a distance of $2\pi R$, where R is the radius of the equator at time T . Thus:

$$g = \frac{4\pi^2 R}{T^2}$$

However, the real important issue is not the calculation of the period and field strength. Instead, the outmost important issue is the calculation of the interior rotation period. The two main theories suggested regarding Saturn's interior rotation period, were that solar winds affected the magnetic field of Saturn, which emitted radio waves in different periods, and, secondly, that the geysers of Enceladus affected the magnetic field of Saturn causing the same result. The key point of Cassini's current mission is to take advantage of the optical means, the spacecraft carries. Using the wide angle camera enables us to create a video from which the rotational period can be measured in different latitudes, without being altered by either solar winds or Enceladus' effects. Further by acknowledging the rate of rotation of Saturn, the velocities of Saturn winds can be calculated using the already existing evidence, in addition to the new ones. For the time being, it is known that their velocity will be smaller if a smaller period is recorded. However, only through the expected video from Cassini, it will be feasible to calculate their value.

Ultimately, I firmly believe that Cassini Solstice Mission is to emphasize in determining the period of different latitudes of Saturn, having as major result to the calculation of the interior rotational period and the velocities of Saturn winds.

CASSINI-HUYGENS (ΠΙΤΑΝΑ)

Οι πλανήτες του ηλιακού συστήματος με τους δορυφόρους τους εξεκομίστηκαν να τραβούν το ενδιαφέρον και την προσοχή των επιστημονικού κόσμου αλλά και των απλών ανθρώπων. Είναι κοντά σε μας και πολλές φορές έχουν και κάποια κοντά στοιχεία με τη Γη μας.

Το διάστημα Cassini-Huygens που έχει ως στόχο τη μελέτη του Κρόνου και των δορυφόρων του θα ήταν πραγματικό να εξετάσει τον δορυφόρο ΤΙΤΑΝΑ.

Ο Τίτανας είναι το μεγαλύτερο φεγγάρι του Κρόνου και έχει παρόμοια τροχιά με τη Σελήνη μας. Είναι το μόνο μέλος στο ηλιακό μας σύστημα που έχει κύκλο ανάλογα με τον κύκλο του νερού στη Γη με διδοχικές βροχές και εξατμίσεις, με καταιγίδες, αστραπές, λίμνες και ποτάμια από υδρογονάνθρακες.



University of Athens

'Alkis Argiriades' amphitheater

June 29, 2012



**Διαγωνισμός Επιστημονικής Έκθεσης
Γίνε Επιστήμονας του Cassini
για μια μέρα!**

Από τις 18-22 Οκτωβρίου 2010 το διαστημικό αεροσκάφος Cassini θα λάβει φωτογραφίες από το σύστημα του Κρόνου. Οι νικητές του διαγωνισμού θα συμμετέχουν σε τηλεδιασκέψεις με επιστήμονες από την ομάδα Cassini της NASA και θα λάβουν ειδικό δίπλωμα από την Ελληνική ομάδα Φυσικής Διαστήματος.

Θεματική Ενότητα:
Οι μαθητές καλούνται να επιλέξουν έναν από τους παρακάτω στόχους του Cassini περιγράφοντας πως η επιλογή τους βοηθάει στην κατανόηση της Φυσικής του Κρόνου και των δορυφόρων του.

ΣΤΟΧΟΣ Νο1 ΔΟΡΥΦΟΡΟΣ: ΡΕΑ
ΣΤΟΧΟΣ Νο2 ΔΟΡΥΦΟΡΟΙ: ΤΙΤΑΝΑΣ, ΤΗΘΥΣ ΚΑΙ ΕΓΚΕΛΑΔΟΣ
ΣΤΟΧΟΣ Νο3 ΜΙΑ ΜΕΡΑ ΣΤΟΝ ΚΡΟΝΟ

Για μαθητές από 10-18 ετών
ΠΡΟΞΕΣΜΙΑ ΛΗΞΗΣ ΔΙΑΓΩΝΙΣΜΟΥ:
15 ΔΕΚΕΜΒΡΙΟΥ 2010

Οργανωτική επιτροπή για την Ελλάδα:
ΟΜΑΔΑ ΦΥΣΙΚΗΣ ΔΙΑΣΤΗΜΑΤΟΣ, Τομέας Αστροφυσικής,
Αστρονομίας και Μηχανικής, Τμήμα Φυσικής, Εθνικό &
Καποδιστριακό Πανεπιστήμιο Αθηνών

**2011 Γίνε Επιστήμονας του Cassini
για μια μέρα!**

Διαγωνισμός Επιστημονικής Έκθεσης

Σας καλούμε να συμμετάσχετε στη 10^η έκδοση του διαγωνισμού έκθεσης της NASA 'Γίνε επιστήμονας για μια μέρα'.

Το Σεπτέμβριο του 2011 το διαστημικό αεροσκάφος Cassini θα λάβει φωτογραφίες από το σύστημα του Κρόνου. Η αποστολή σας είναι να επιλέξετε το στόχο, του οποίου η παρατήρηση πιστεύεται ότι θα φέρει σημαντικά επιστημονικά αποτελέσματα και να περιγράψετε σε μία έκθεση τους λόγους της επιλογής σας. Οι νικητρίες εκθέσεις θα βραβευθούν και θα δημοσιευθούν στην επίσημη ιστοσελίδα της NASA.

Στόχος 1: Υπερίων

Στόχος 2: Ρέα & Τιτανάς

Στόχος 3: Κρόνος

Για μαθητές από 10-18 ετών
ΠΡΟΞΕΣΜΙΑ ΛΗΞΗΣ ΔΙΑΓΩΝΙΣΜΟΥ:
15 ΔΕΚΕΜΒΡΙΟΥ 2011

Ανάλυτικές οδηγίες για το διαγωνισμό στο:
<http://www.space.physics.uoa.gr/Outreach.html>

Αποστολή εκθέσεων στο email:
cassini.gr.scientist@gmail.com

με θέμα(subject):
Ονοματεπώνυμο_Σχολείο_Στόχος

Οργανωτική επιτροπή για την Ελλάδα:
ΟΜΑΔΑ ΦΥΣΙΚΗΣ ΔΙΑΣΤΗΜΑΤΟΣ, Τομέας Αστροφυσικής,
Αστρονομίας και Μηχανικής, Τμήμα Φυσικής, Εθνικό &
Καποδιστριακό Πανεπιστήμιο Αθηνών