

# What's new, Mr. Galileo?



## Die 5.a-Klasse des BRG Kepler Graz gewinnt einen ESA-Wettbewerb

Unter obigem Titel schrieb die *ESA* (European Space Agency) einen internationalen Wettbewerb für Schulklassen im Alter von 13-15 Jahren aus. Aufgabe war, einen Aufsatz in englischer Sprache über Weltraum-Astronomie zu schreiben. Aus 14 Teilnehmerstaaten nahmen über hundert Schulklassen teil. In Österreich gewann die 5.a-Klasse des BRG Kepler den ersten Platz. Trotz extrem kurzer Fristen war es dieser Klasse gelungen, innerhalb des Physik- und Englischunterrichts eine fundierte Arbeit über Nutzen und Problematik weltraumgestützter Astronomie zu verfassen.

Als Preis wurde die ganze Klasse (von 15.-20. November) mit drei Lehrern zum europäischen Weltraumzentrum in Kourou (französisch Guyana) eingeladen. Der Aufenthalt war ein einmaliges Erlebnis, insbesondere ist der ESA für die perfekte Betreuung zu danken.

Anlass für diesen Wettbewerb ist der größte Satellit, den die ESA bisher gebaut hat: Das *XMM-Röntgenteleskop*. XMM steht für X-Ray Multi Mirror was soviel heißt wie: Röntgenstrahlen Vielfach-Spiegelteleskop. Im Dezember 1999 wurde es wie geplant in eine Erdumlaufbahn gebracht. Ähnlich dem erfolgreichen Hubble Weltraumteleskop wird das XMM ab Jänner 2000 das Universum erforschen, allerdings nicht im Bereich des sichtbaren Lichts, vielmehr untersucht es die kosmische Röntgenstrahlung. Sehr viele Himmelsobjekte senden Röntgenstrahlung aus, etwa unsere Sonne - insbesondere erwartet man aber neue Ergebnisse über extreme Objekte wie Quasare oder Schwarze Löcher. Röntgenstrahlung kann man nur mit speziellen Spiegeln auffangen - 58 ineinandergeschichtete goldbeschichtete Zylinder ergeben für das XMM 120 m<sup>2</sup> verspiegelte Fläche! Die Strahlung tritt in die Zwischenräume ein und wird vielfach (unter sehr flachen Winkeln) reflektiert - nur so kann man sie zum Detektor führen.

Gerhard Rath

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"The space the final frontier". That's how the successful series of Star Trek begins. The Enterprise discovers new life forms that are similar to ours. But it could be that they aren't similar to us at all, and there is no way that we could survive on their planet. Because life forms could also live on planets where we think life is impossible. For us the dimensions of the universe are unbelievable. A question that we ask ourselves is: "How big is the universe?" Some people say that the universe is always expanding, but is this true?

We are only at the beginning of research on the universe but we are doing better all the time. A good example for this is the VLT. It enables us to have a better look at the stars that are farther away. With these telescopes you can even see a man on the moon. Of course it is very complicated to produce these telescopes, and especially the mirrors inside. It is hard to believe that it takes about two years to make one of these mirrors, and how precise the work on them is done. For example these mirrors have a difference of 1 mm per 156 km.

The satellites are also very important to us humans on earth. Most of our telephones wouldn't work and there wouldn't be that much communication between the countries on earth. And less communication would mean less understanding. We also would neither have any navigation system like GPS nor would we have this variety of TV channels. We would never be able to forecast the weather this precisely, and hurricanes, earthquakes and volcano eruptions would become an even more serious problem than they are now, because the people couldn't be warned fast enough. Life on earth would change a lot without our satellites.

All this sounds like a ballad of progress. However, at least on second thought, other aspects of space research cross one's mind. For example that the risk that something might happen to one of the astronauts is also high.

There is a lot of competition on earth between the different countries or different organizations. This has a good side but also a bad one. The good thing about it is that everyone wants to be the best and the fastest in this work. Nevertheless if everybody worked together progress could be achieved much faster. But most humans are too egotistical and want to earn all the fame and fortune for themselves. And there is the problem that every spaceship leaves fuel-tanks and other wastes in an orbit around the earth. The lack of communication between different countries, who are supposed to work together, is also perturbing.

Another question that we might ask ourselves is if all of this effort is worth the money? We could as well invest all the money in the future of the developing countries. All in all we think that exploring space is very important because we couldn't imagine life without the discoveries, that we have made in outer space, any more. And we know perfectly well that the problems of our Mother Earth cannot be solved by money, but only by intelligent solutions.

Last but not least exploring the universe might also help us to find our right position in this world and open our senses for our environment, far and near.

