



# NEWSLETTER



OF THE XXI INTERNATIONAL OLYMPIAD IN INFORMATICS  
BULGARIA - PLOVDIV, 8-15 AUGUST 2009



MINISTRY OF EDUCATION, YOUTH AND SCIENCE

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## The Big Contest



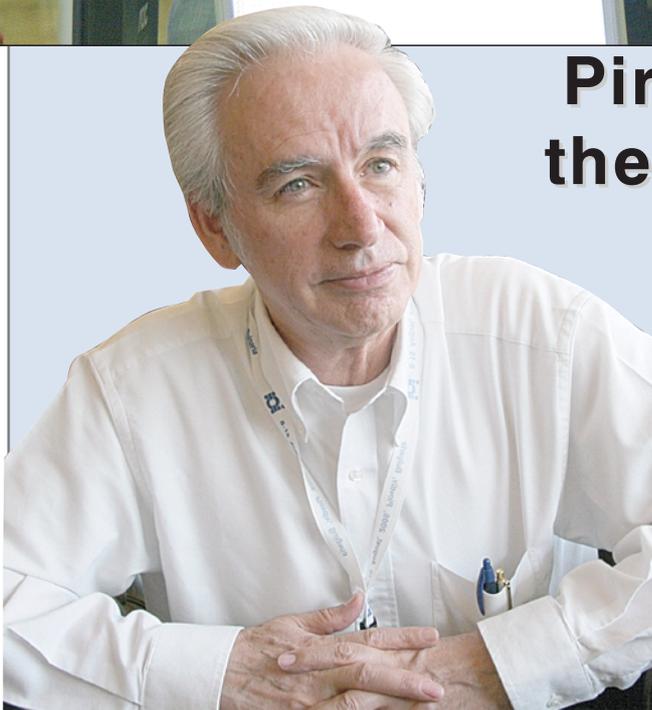
### Piracy won't scare the software giants

**Arturo CEPEDA,**  
*President of the International Olympiad in Informatics*

**- Mr. Cepeda, how do you find the organization of the XXI Olympiad? Does the level of participants tend to be higher?**

*- It was extremely impressive that the Bulgarian President came for the Opening Ceremony and greeted the participants and guests. We have not had such VIP presence so far. And I am familiar with all Olympiads up to now because Mexico is one of the countries that first joined this movement. I had the opportunity to talk with Mr. Georgi Parvanov and with the minister of Education Mrs. Yordanka Fandakova and I must say I am happy that they are ready to support the development of informatics and have a clear vision on the significance of IT technologies.*

*Continued on p. 2*



# Piracy won't scare...

Continued from p. 1

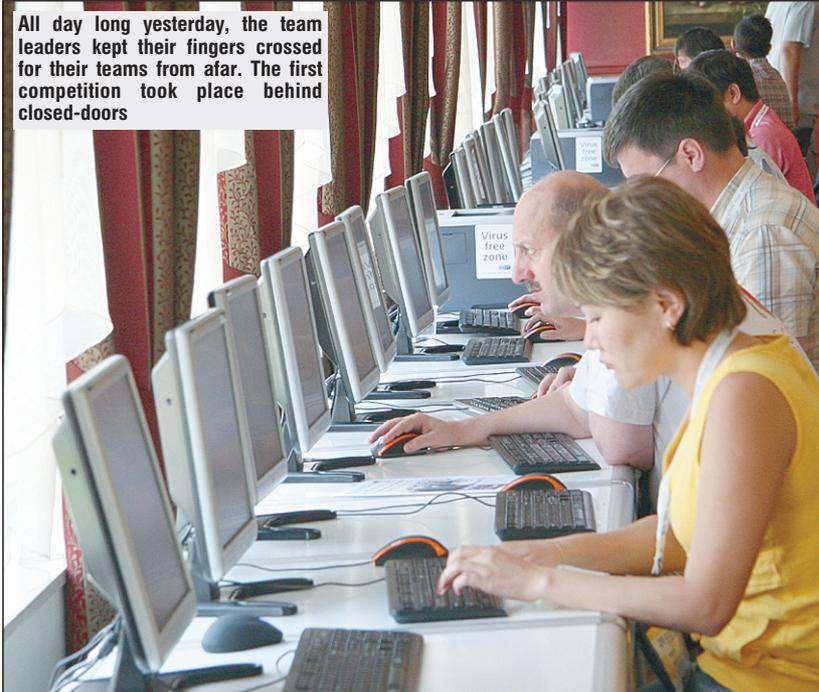
Every year the level of teams is higher and higher. We started with 13 countries, and now we are already 83. The competition tasks get harder and harder which means that the Olympiad is technically developing. However, we do not intend to amend the regulations in place, according to which each country can participate with just one team of four members. Regardless whether it is China with a population of over 1.4 bln. or

Luxemburg with barely half a million. Bulgaria is entitled to two teams as a host country, but only the first one is the official one and can win medals. Else, it would not have been fair to the other countries.

**- The competition managed to gather great intellectual potential. How is informatics doing globally?**

- This is one of the most modern sciences because software is everywhere. A computer is nothing without software. Thanks to IT technologies, the countries increase their GDP (Gross Domestic Product). Today's software business is so big that it accounts for as much as 15% of the GDP in some countries. It is absolutely essential that the countries strive for entering this business as soon as possible, else there will be a negative impact on their future development. Global companies, such as Microsoft and Google have a turnover exceeding the GDP of a number of countries. They are so powerful that piracy will not be fatal for them. Violations usually target older products, but the next day the companies come up with more modern ones. The best defence against piracy is to have a new

All day long yesterday, the team leaders kept their fingers crossed for their teams from afar. The first competition took place behind closed-doors



product ready before the previous one has been stolen.

**- Does this mean that the big players in the software business are interested in the medalists in the Olympiads?**

- Of course. Giants like Microsoft are ready to offer them jobs and scholarships. The point of this competition is to discover software talents. After they finish school, gold medalists go to reputable higher education institutions, such as MIT, Harvard, as well as the big European ones. All over the world, technology universities are interested in the applicants' CVs and if they are Olympic champions, they are offered scholarships. A number of Bulgarians receive full scholarships which cover all the costs for their tuition and subsistence.

**- How do you find the development of Informatics in the schools?**

- Until soon, curricula used to develop intelligence through subjects, such as Mathematics, Physics, Chemistry, etc. It is absolutely necessary now to put informatics into play because this science came to stay. Young people have to be not only computer literate, but also to be familiar with the software technology. And this is extremely important for the development of the human intelligence of mankind.

**- Your own children are also medal winners at Olympiads. Are they following in your footpath?**

- My oldest daughter, Martha, competed for Mexico at Olympiads in Physics and Chemistry. My son, Caesar, represented our country in Informatics and in Chemistry, while Maria was on Mexico's Informatics team for two successive years. This is why we, as a family, organize the National Olympiad in Informatics. We are open to sponsors in terms of big companies dealing with software and electronics. The good contacts we had, established through the years, convinced the International Committee to entrust to us the hosting of the International Olympiad in 2006. That was fantastic. The guests and participants stayed at five-star hotels.

„Most of the participants in the 21st International Olympiad in Informatics have probably taken some CISCO courses in their countries. This is why they can appreciate the efforts of the 11 Bulgarian students who assisted in the provision of the resources required for running this competition,“ commented Dragostina Grancharova, Business Development Manager for the Education sector in Cisco focused on Central and Eastern Europe. Involving the 11 boys in the installation of the computer network was also a vocational schooling opportunity for them.

# These students have amazing talent!



„The Olympiads in Informatics have established some traditions. They were completely met by the international contest in Plovdiv,“ holds Prof. Dr. Stoyan Kapralov, one of the doyens in teaching Informatics and an academic manager of the Bulgarian national teams. According to him, the young people have to be encouraged to master computer technologies and this is the reason why a stimulating easy task was included in the contest assignments. At the same time, Plovdiv has gathered amazing talents. This refers to the representatives of the participating countries as a whole. Their scores, their achievements are already of such magnitude that we - their teachers, can only be filled with admiration.

What happens to these talents after the Olympiad?

„It suffices to look at the Scientific Committee of the XXI Olympiad to get a clue. Velin Tsanov, Svetoslav Kolev, Radostin Rumenov - these are all gold medal winners from school competitions. They have successful careers or pursue their PhDs at the most prestigious universities and hardly regret the choice they have made.“

„The Bulgarian Informatics school has managed to preserve its strong traditions despite the hard competition,“ scientists think. „With the potential of a 7-8 mln



people in our country, we achieve the results commensurate with those of the best, such as USA and China. Neither the social changes, nor even the global economic crisis prevented the host country from developing successfully in this field. On the contrary, these processes have even accelerated, believe the experts. The reason for this, no doubt is the developed system of camps and workshops. My observations are that by working autonomously the motivated kids accumulate a lot of knowledge and a week of intensive sessions with good leaders can direct or streamline these accumulations in the desired direction,“ confirms Prof. Kapralov. „Some time ago, it was a great achievement if a contestant managed to get to the team lists of two contests in succession. Now this is no surprise. We have kids who are already asking where the Olympiad will be held in 2012!“



# We give the teams a hard nut to crack

**Velin TSANOV, Chair of the Scientific Committee**

„One of all 8 competition tasks during the two competition days will be a real challenge even for the best prepared Olympians. I will personally be very happy if any of my young colleagues solves it,“ announced Velin Tsanov, Chair of the Scientific Committee. „It is, so to say, the hard nut in the big competition.“

According to the existing regulations, the representatives of the 83 participating countries work on two selected sets of four tasks each. Apart from the very tough task, there is also a very easy one, which even the novices should be able to solve. Students can check their performance on this task themselves, i.e. there is full feedback. Each contestant can tell if they have scored a point on it. The people in the spacious Hall 11 have different levels of preparation and arrangements must be made to make sure each contestant will find a „suitable track“.

Velin Tsanov remembers the contests he took part in himself not very long time ago. He was a gold medal winner in IOI'2001 and IOI'2002. The other members of the Scientific Committee are also former medallists. If we count all the medals we have won all together, the number will be higher than 20,“ jokes Velin.

„Crowned“ with champion titles, he had the chance to study and specialize in the USA and is currently an important player at the D.E.Shaw&Co investment fund in New York. Naturally, he wouldn't say what exactly he does, but in general terms, his job is to design and develop computer programs for various financial transactions. For travel and appointments at the Olympiad, Velin received the support of the compa-



ny he works for.

Apparently, the dynamism of the contest is only natural for him because of the fast rhythm of his lifestyle in the USA. „I can only come to

Bulgaria just once a year,“ admits Velin. But in New York there are a lot of Bulgarians now, so it is getting easier to cope with homesickness. The champion from the beginning of the 21st century is happily married to a Bulgarian and is expecting to become a father soon.

„The 7th International Olympiad in Informatics took place at the end of June at Eindhoven in the Netherlands. The competition, which hosts the winners of many national contests, attracted over 200 competitors from 52 different countries. It is far from being an exclusively European affair, with teams from as far afield as Colombia and China. Great Britain is not a newcomer to the event, but having been unable to attend for the last two years it felt like it at times. This year we picked a team of 5 from the „British Informatics Olympiad“, four of whom were able to attend. We flew into Amsterdam, from where we were taken to the Eindhoven University of Technology (TUE), the main competition site. For the week of the competition, the IOI took over much of the campus. As well as rooms for the computing a hospitality tent was set up, and many of the students were brought in as guides. Accommodation was at the nearby „Center Parcs“ complex.



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**E**ither a task in informatics reflects any image in mind or not; references (hints) to any reality can take place in the task. This reality can relate to local circumstances, the host town, the host state or to sponsors of the informatics olympiad (at the same time, the task should be "culturally neutral"). By our experience of conducting informatics olympiads in Kyrgyzstan since 1985 and submitting tasks to preceding IOIs we classify such references, survey such tasks and propose some techniques to make tasks more interesting and original and to attract different sponsors. Alternative types of tasks are also discussed.



John Atanasov - Junior: the new Bulgarian award for most ingenious solution of the competition tasks. Statuette by sculptor Tsvyatko Siromashki.

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**E**xisting olympiads in mathematics and informatics are fixed form competitions for individuals with quite stable lists of task types. Outside the scope of these competitions falls a lot of interesting and challenging tasks like puzzles, games, logic tasks, and practical tasks outside the classroom. Team competitions offer a new dimension in a task solving process where successful collaboration between team members is one of basic requirements for achieving high results. This paper describes an annual (since 1996) Latvian team competition in mathematics and informatics for high-school students called „Ugale“. Classification of the main task types is given and representatives of these task groups are given. Suitability of different task types in different contests is discussed. The evolution of the form and content of the competition is described.

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**T**he competition tasks at the International Olympiad in Informatics have evolved over its 20-year history. We distinguish three periods in this evolution and highlight it from various viewpoints. The 101 competition tasks are presented in a table that summarizes their task type and difficulty level, and that classifies them according to concepts involved in their problem and solution domains.



We were there during an unexpected heat wave (the climate is usually similar to our own), so the cool breezes from the complex's lakes and the swimming pool were much appreciated.

Although individuals knew their own scores, and the team leaders knew how many people would get each type of medal, we arrived

unaware of the medal boundaries. After a procession of speeches all was finally revealed. We received a gold and a bronze medal, with our gold medallist Patrick Smears coming second in the whole competition, and our bronze medallist Justin Santa Barbara narrowly missing silver. Lev Bishop and David Armstrong, our other competitors, both performed very respectably

despite missing medals.

The competition was a great success, both for the week's events and the team's performance. Inevitably there were a few hiccups, but thanks to the hard work of the organisation and the guides everyone involved had a wonderful time!

**Richard Forster,**  
**Deputy Team Leader of the**  
**British delegation**

## Is informatics a girl's cup of tea?



perfect in everything they do. Boys, however, prioritize and focus all their energy on their priorities. They say this is crucial in informatics.

Let us share with you a conversation overheard a few days before the Olympiad.

The Bulgarian organizers commented whether to issue an award for the best performing girl. They dropped that idea at once - actually there are no privileges for women in informatics. One is either good at it, or not, no matter whether you are a girl or a boy.

Still look around: the female presence at the contestants' computers is more than modest. Of all some 320 participants, how many girls do you think are there??

All in all, they are 17. Most girls come from Asia - 6; 5 are from Africa, 2 from the Americas, and 4 from Europe. The teams from Venezuela, Libya, and Ghana have two girls on their teams. The ladies' presence is more discernible, however, among the leaders. This also has its explanation: a lot of women convert from computing to teaching. You can bet their „female“ way of thinking does not prevent them from raising male champions!

Is informatics a girl's cup of tea? Why at these contests you can count the girls on the fingers of your hands? According to experts, somewhere at the age of 13-14 young people form male and female ways of thinking. Girls try to be

## Bulgarians on other teams

**Todorka Dimitrova**, professor at Technical University Sofia, is deputy to Denmark team leader Jorgen Nielsen. „Informatics is not a compulsory subject on Danish schools curricula,“ she says. „At the same time, their educational institutions are networked and the teaching of all subjects is done applying the interactive approach. For the young citizens of the Northern country, computers in schools are like the cutlery on a kitchen table. Those who are keen on informatics have to work on their own - there are well developed websites on the Internet offering information and problems. Contests are held on a regular basis for all candidates. The best of them attend further training and tests before the shortlist of the core team is produced. From that point on, their training is focused on the big competitions.“



**Viktor Konstantinov** is one of the four members on the British team. The boy is from Sofia and is an alumnus of the world-renowned Mathematical School in the capital city and of the American College. For two years now, he has been a student in a small town near Manchester and lives in the school hostel. He has to take care of himself on his own because his parents live and work in Bulgaria. While surfing the Net, he learned of the Olympiads. When he showed up for a casting, he proved to be one of the best. According to him, Olympiads have no nationality - everybody plays and wins or loses for themselves.





ised by Tsar  
I v a n  
Alexander  
whose por-  
trait can still be seen in  
the narthex of the bone-  
vault. Like other monas-  
teries in Bulgaria,  
Bachkovo Monastery  
used to have a religious  
school. After the Ottoman  
invasion into Bulgaria in  
the end of the 14th centu-  
ry, the Bulgarian Patriarch  
Evtimii was sent on exile  
in the monastery.  
However, the exile did not  
dishearten the Patriarch  
and he, together with his



**B**achkovo Monastery is the second largest monastery in Bulgaria. It is situated about 30 km to the south of Plovdiv in the valley of the Chepelarska river, also known as river Chaya. The location of the monastery - in the heart of the gorgeous Rhodopi Mountains - together with its impressive size and ancient spirit make it one of the most visited landmarks in Bulgaria.

The monastery and its adjacent area have grown into a picturesque tourist sight where dozens of small shops, stalls, and restaurants border the lane to the monastery gates. Here one can buy practically anything that grows or is manufactured in the Rhodopi Mountains - rare herbs, home-made wild fruit jam, yogurt and white cheese made of goat or buffalo's milk, bright-coloured woolen blankets...

The monastery was set up in 1083 by the Byzantine military commander of Georgian origin, Grigorii Bakuriani and his brother Abazii. Unfortunately the only building still preserved from that time is a two-storey bone-vault, which lies about 300m to the east of the monastery. The bone-vault is a unique must-see historical and architectural monument for its old frescoes, which rank among the most valuable works of Orthodox art of the 11th -12th c.

At the time of the Second Bulgarian State (1185-1396) the monastery was generously patron-



disciples, actively worked on religious and cultural issues behind the thick monastery walls.

Although Bachkovo monastery survived the first invasion of the Ottoman armies in the 14th century, later on it followed the unfortunate destiny of the majority of Christian orthodox monasteries in Bulgaria and was raided and destroyed. It was restored in the end of the 15th century. Its dining hall was reconstructed in 1601 and the present-day church Virgin Mary was finished in 1604. The frescoes in the dining hall, finished in 1605 by an unknown master, are remarkable for their artistic value. What draws the attention of visitors most is the miraculous icon of Virgin Mary-Compassion. A long queue of pilgrims, coming here to pray to the Mother of God, usually meanders far outside the church entrance. The monastery has another church - St Nikola (1834-1837) which rises in the southern part of the yard and impresses with the well-preserved frescoes of the famous artist Zahari Zograf (including a selfportrait) finished in 1841. The monastery also has its own museum which holds rare religious items from different times.



## Weather Changeable

The weather forecast for Plovdiv on 11-12 August: a mix of clear and cloudy skies. Minimum temperatures 15-16 degrees Celsius, maximum temperatures 27-28. Slight chance of rain on the second day

### Sponsors:

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## DICTIONARY

English	Bulgarian
rate (e.g. taxi, phone, etc.)	тарифа
bill (e.g. in a restaurant, cafe, etc.)	сметка
Railway station	Жп гара
Bus station	Автогара
Bus stop	Автобусна спирка
underground	Метро
ticket	билет
Von voyage	Приятно пътуване!

### Co-organizers

Municipality of Plovdiv  
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