



NEWSLETTER



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



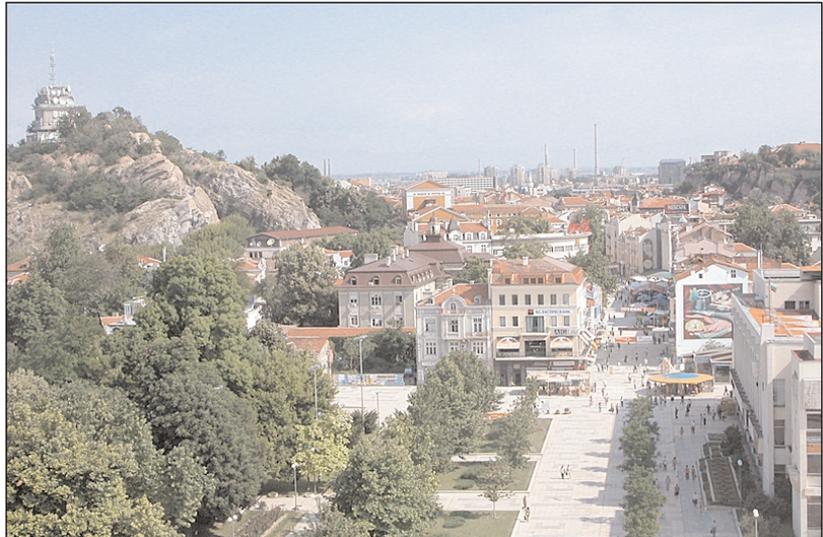
MINISTRY OF EDUCATION, YOUTH AND SCIENCE

ISSUE 1, SATURDAY, 8 AUGUST 2009



**Slavcho
ATANASOV,
Mayor of
Plovdiv**

Welcome



Dear Informatics Specialists!

I am delighted to welcome you to the city of Plovdiv and I do believe that you will return home with wonderful impressions of our beautiful and hospitable city. To me, as Mayor, it is a great honor to host this Olympiad in Informatics because this forum is outstandingly fair. Please allow me to show some local patriotism here by noting that the young Informaticians from Plovdiv are exceptionally talented and a hard competition. I personally keep my fingers crossed for them and I hope that they will show top performance. I wish success to all participants and I am confident that Plovdiv will be a highly organized and attentive host of the event. It is particularly important for us that

the event should be a success because we have considerable traditions in mathematics and informatics education - both at secondary and higher levels, and we hold firmly to being a leading academic center in our country. Let me once again greet the participants and wish high achievements to all of them.



The city is yours, our friends!

Here are Alexandar Todorov /left/, Kalina Petrova and Alexandar Gyorev. Adding Yassen Trifonov to this photo, we would have the complete team of the host city. The four teenagers are students of the Model School of Mathematics in Plovdiv. For three years now, they have taken part in a number of competitions and training workshops in Informatics. Their achievements are commensurate with those of the students on the national team. However, they have an advantage of their own: they are Plovdivians. They will compete with each and every one of their peers, but are also ready to make new friends. Should they have the possibility, they would show their peers from abroad their favourite places in their hometown. For Kalina, this is the Antique Amphitheater. For Alexandar Gyorev - the narrow streets of the Old Town. The other Alexandar believes that one can best get a feeling of the city at the foot of the hills if they look at it at night from the TV tower.

Dear friends, during the days of the Olympiad, this city will be yours, too!



Plovdiv is the second largest city in the Republic of Bulgaria after Sofia and ranks 83rd by population in the European Union. This is the administrative centre of the South Central Planning Region, the District of Plovdiv and the four municipalities: Plovdiv, Maritsa, Rodopi, and Kuklen. The city is an important economic, transport, cultural, and educational centre for the whole country.

Plovdiv is a city with population of 379,493 people. [1] It is situated in the central part of Northern Thrace, on the two banks of the



Antique Amphitheatre

Maritsa River. It is located some 15 km north of the Rodopi Mountains and 50 km south of Stara Planina. The city is situated at the feet of seven syenite hills,

hence it is often called „The city on the hills“ or „The city on the seven hills“.

Plovdiv is the venue of a host of business and cultural

events, among which are the International Fair Plovdiv, The Stage at crossroads International Theatre Festival, the Golden Chest Television Festival, to name a few. A number of antiquity monuments have been preserved in the city, among which are the Antique Amphitheatre, The Roman Odeon, the Agora (Roman forum), The Roman Theater, the late antiquity building of Eyrene and many others. In the 12th century BC, the prehistoric settlement on the Guards' Hill (Nebet teppe) grew into the ancient Thracian town of Evmolpia to be one of the first urban centres in South-East Europe. Remains of that city can still be seen today.

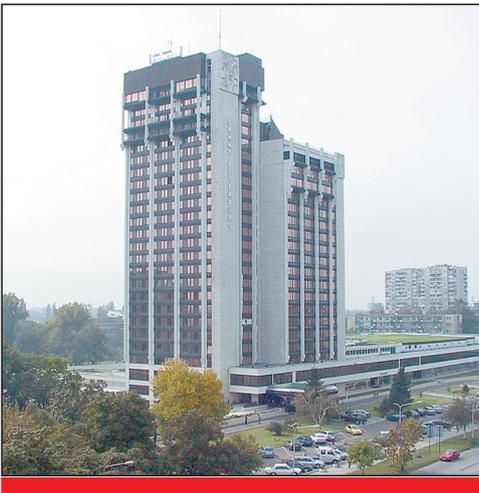
The hotels



Hotel Novotel Plovdiv, where the contestants are accommodated, is situated on the Northern bank of the Maritsa River in close proximity to International Fair Plovdiv, the city centre and the Old Town. An added value is the serene and friendly neighbourhood with its tasteful and modern business buildings contributing to the ennobling of the surrounding urban environment.



Hotel „Novotel Plovdiv“
2, Zl. Boyadjiev Str., 4000 Plovdiv
Tel: (+359 32) 934136, (+359 32) 934481,
FAX: (+359 32) 934346, (+359 32) 934160



Park-Hotel Sankt Peterburg hosts for a week the guests of the Olympiad, as well as the team leaders. This is the tallest, the most modern complex in Plovdiv has an air of bears the classical sophistication of the city. Situated in the heart of Plovdiv, the hotel creates the atmosphere of unique harmony, aesthetics, comfort, and modern European style.



Park-Hotel „Sankt Peterburg“ Plovdiv
97, Bulgaria Blvd., 4003 Plovdiv
Tel: (+359 32) 9103, (+359 32) 951830



International Fair Plovdiv is a leading exhibition centre in Southeast Europe, a business bridge between the East and the West. Ever since its establishment in 1892, International Fair Plovdiv has been dedicated to showcasing the advancement of Bulgaria and the Bulgarian economy to the world, as well as to intensify the contacts between the Bulgarian and foreign companies.

IFP is the organizer of trade fairs, exhibitions and Bulgaria's participation in the World EXPOs. The annual exhibition calendar comprises over 40 events covering some 60 key industries of the world economy, with the participation of more than 8,000 exhibitors from 60 countries.

www.fair.bg

Only One Person Knows The Competition Tasks In Advance

It is only the Chair of the Scientific Committee of the International Olympiad in Informatics who knows the competition tasks due to be solved by the contestants during the two competition days. The international team of experts is led by Velin Tzanov, one of the most successful Bulgarian participants so far, who is currently living and working in the USA. He and his colleagues prepared the tasks behind closed doors, after which they tested them, but it is only Velin who attended all closed-door meetings. According to the procedures, proposals for

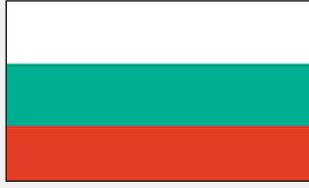


tasks arrived from all over the world before the Jury selected the best of them and compiled the test data.

360 computers were installed with flawless arrangements made by the technical teams in

Hall 11 of the International Fair Plovdiv and in Park-Hotel Sankt Peterburg. AngelSoft staff installed the required cabling, networked the computers, and tested the system at full load. The first test

was carried out by students from the High School of Mathematics in Plovdiv in order to prevent any technical hiccups. According to the procedures, the contestants and the team leaders have to be accommodated at different locations. This is why the teachers will stay at Park-Hotel Sankt Peterburg, where they will translate the tasks and will provide online consultations. After the end of the competition, the computers, which have been provided by the Ministry of Education, will be distributed among the schools throughout Bulgaria.



Republic of Bulgaria is a country in Europe. It is located in the Eastern part of the Balkan Peninsula and occupies 22% of its territory. It has a total area of 110,843 km, of which 110,510 km are occupied by land, and 333 km are covered with water. The population is c. 7,640,000 people (2007). The capital city of Bulgaria is Sofia.

Bulgaria borders the Black Sea to the East, Greece and Turkey to the South, Republic of Macedonia and Serbia to the West, and Romania to the North. The total length of the state border is 2,245 km, of which 1,181 km land, 686 km - river (mainly downstream Danube) and 378 km - sea.

The Bulgarian state in South-Eastern Europe dates back to the 7th century, when the First Bulgarian State was founded (632/681-1018). It played a key role in the dissemination of Christianity, literature and culture among the peoples of Eastern Europe. Several centuries later, however, with the decline of the Second Bulgarian State (1185-1396/1422), the country was occupied by the Ottoman Empire and remained within

its borders for nearly five centuries. The Russian-Turkish war of 1877-1878 led to the foundation of the Third Bulgarian State. After the Second World War, the country became part of the Eastern Bloc and was ruled by a communist regime. In 1990, parliamentary democracy was re-established in Bulgaria and today the country is a member of the European Union and NATO.

On the island of Livingston in Antarktika, Bulgaria has established its own base called Sveti Kliment Ohridski and, being a consultative member of the Antarctic Treaty, is involved in the running of the territories south of 60° southern latitude.



One of the most loved holidays in Bulgaria is the 24 May - the Day of the Slavic Script and Culture.

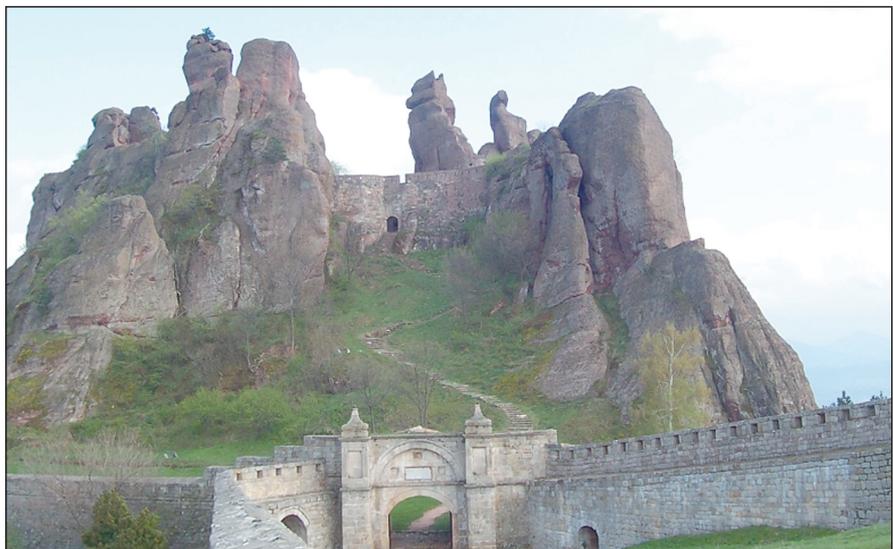


Folk singer Valya Balkanska's voice is part of the Golden Fund of Bulgarian folk music. She is renowned for her performance of the song *Izlel je Delyo Haydutin*. In 1977, this song was included in the Golden Record phonograph record and was sent into space on board the two Voyager spacecraft. In 2004, they left the boundaries of the Solar System.

Wonders of the World

The Belogradchik Rocks are on the list of natural landmarks nominated for the world's new Seven Wonders of the world. There is an unfolding media campaign in the country in support of the Bulgarian nominee. The unique range of rocks is located in the North-West of Bulgaria. It covers an area that is 30 km long and 15 km wide. This amazing natural phenomenon has been shaped by water and winds for 200 million years now. The shapeless huge boulders have become sculptures taking resemblance to mythical creatures, human silhouettes, animals, and birds. The 200m-high columns form a natural fortress whose defensive potential has been exploited since ancient times. The fortress fortifications were built and appended during three time periods: Roman (1-4 c. AD), Medieval (17-19 c. AD) and Ottoman (1805-1837).

The Belogradchik Rocks were proclaimed a landmark in 1949.





The first seven years

The first seven years are crucial both in the course of human life, and - as it has proved - in the background of the International Olympiads in Informatics, says Assoc. Prof. Asen Rahnev, Dean of the Faculty of Mathematics and Informatics at Plovdiv University „Paisii Hilendarski“. He is also Deputy-Chair of the Host Organizing Committee of the XXI IOI. The first gold medal winner in international competitions is a Plovdivian - Emanuil Todorov, an alumnus of the „Chernorizets Hrabar“ Secondary School, the English Language School and the Mathematical School (in his one-year Vocational Training Module).

He was a top scorer and received the special prize. Then he graduated from the MIT, having become the first Bulgarian enrolled at this elite university. After that he did a PhD and settled to work and live in the USA. At the second International Olympiad in Informatics, the gold medal tradition was continued by Stoyan Halkaliev and on and on it went, until Ivaylo Riskov - the golden boy of 2003 come into play. Prior to the international competitions, however, the Plovdiv school had some very strong years. We would always win the nation-wide contests. For many years in a row, the national team was led by

Plovdivians. It was Ognyan Gavrailov and me who worked with the kids. We were teachers at the Mathematical School in Plovdiv at that time... But let us go back still earlier - somewhere around 1981-82, when all this system was run by the then Assoc. Prof. Pavel Azalov. Later on, the professor led the Bulgarian national team at the Olympiad for university students and we ranked fourth in the world in the same year when Bulgaria finished fourth in the World Cup Football: which is why our achievement did not provoke as much media attention as it deserved.

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A special illustrated postcard dedicated to the XXI International Olympiad in Informatics - Plovdiv, 8 - 15 August, has been in circulation in Bulgaria since 27 Jul 09. The philately edition was validated during a ceremony at the Bulgarian Postal Museum by the Organizing Committee of the contest and by the Minister of Education, Youth and Science Yordanka Fandakova.



Very few people seem to know that the new Minister of Regional Development and Public Works has also been an informatics champion. In the now distant year of 1982, Rosen Plevneliev was a winner in the Bulgarian national competition which was the forerunner of the International Olympiad in Informatics



The Olympiad determined my life

Ivaylo RISKOV,
gold medal winner at the
Olympiad in 2003

After the Olympiad in 2003, I was enrolled as a student at Sofia University, and a year later I continued my studies at the Massachusetts Institute of Technology in Boston (MIT), the USA. I graduated

last year with a Master's degree in Computer Science and since then I have been working (to put it formally, I have been pursuing my career in the field of my specialisation) with a financial company in New York, where I am responsible for the company's software infrastructure and financial models.

I suspended my involvement in competitive informatics a year ago, just before my graduation. During the first year after I left for the USA, in 2005, I took part in the International Olympiad for university students as part of the MIT team. Although it can be said that the Olympiad for university students is anal-

ogous to the Olympiad for school students, the two competitions are rather different in terms of rationale, organization, and dynamism. The biggest difference, however, is that the contest for university students is a competition of teams, of universities, and not of individuals (unofficially, the Olympiad for school students is a contest of nations). During the following years, I was also one of the team coaches (it is common practice for coaches in Olympiads for university students to be students who are also former contestants). In no attempt to give myself credits, I am happy that the team managed to make it to the fourth and second places, respectively - unlike the not so brilliant performance of the team in the year when I was a contestant.

In addition to competitions for university students, for a certain period of time during 2004 I was still involved in Olympiads for school students in Bulgaria by proposing problems and providing training to part of the national team for the Balkan Olympiad in Informatics during that same year, which was also held in Plovdiv. I most honestly regret I will not be able to attend this year's Olympiad in my home town - Plovdiv and I wish success to all contestants!



The idea of initiating international olympiads in informatics for school students was proposed to the 24th General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO) in Paris by the Bulgarian delegate Professor Sendov in October 1987. This plan was included into the Fifth Main Program of UNESCO for the biennium 1988-1989 (Section 05 215). In May 1989, UNESCO initiated and sponsored the first International Olympiad in Informatics (IOI). (Quoted from the IOI'89 and IOI'92 Report).

The IOI is one of five international science olympiads. The primary goal of the IOI is to stimulate interest in informatics (computing science) and information technology. Another important



The gold medalists of 2005... and <http://ioinformatics.org>

goal is to bring together exceptionally talented pupils from various countries and to have them share scientific and cultural experiences.

The IOI is organized annually in and by one of the participating countries. Each participating country typically sends a delegation of four pupils and two accompanying adults. The pupils compete individually and try to maximize their score by solving a set of informatics problems during two

competition days. The problems have been algorithmic programming problems to be solved on a personal computer. Cultural and recreational events are organized on the remaining days.



IOI'2006 International Organizing Committee

Past International Olympiad in Informatics'

- | | |
|---|--|
| 1989 - Pravetz, Bulgaria - May 16-19 | 1998 - Setubal, Portugal - September 5-12 |
| 1990 - Minsk, Belarussian Republic, Soviet Union - July 15-21 | 1999 - Antalya-Belek, Turkey - October 9-16 |
| 1991 - Athens, Greece - May 19-25 | 2000 - Beijing, China - September 23-30 |
| 1992 - Bonn, Germany - July 11-21 | 2001 - Tampere, Finland - July 14-21 |
| 1993 - Mendoza, Argentina - October 16-25 | 2002 - Yong-In, Korean Republic - August 18-25 |
| 1994 - Haninge, Sweden - July 3-10 | 2003 - Kenosha, Wisconsin, USA - August 16-23 |
| 1995 - Eindhoven, The Netherlands - June/July 26-3 | 2004 - Athens, Greece - September 11-18 |
| 1996 - Veszprem, Hungary - July/August 25-2 | 2005 - Nowy Sacz, Poland - August 18-25 |
| 1997 - Cape Town, South Africa - November/December 30-7 | 2006 - Merida, Yucatan, Mexico - August 13-20 |
| | 2007 - Zagreb, Croatia - August 15-22 |
| | 2008 - Cairo, Egypt - August 16-23 |

The first seven years

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There Plovdivians took part in the preparation of the team: Kosta Garov, Ogi, and me. This is how history was made: there was an accumulation through the years, so when the international competitions came about, we were ready for them.

This high speed at which things unfold in our field, still offers a number of advantages. During the first

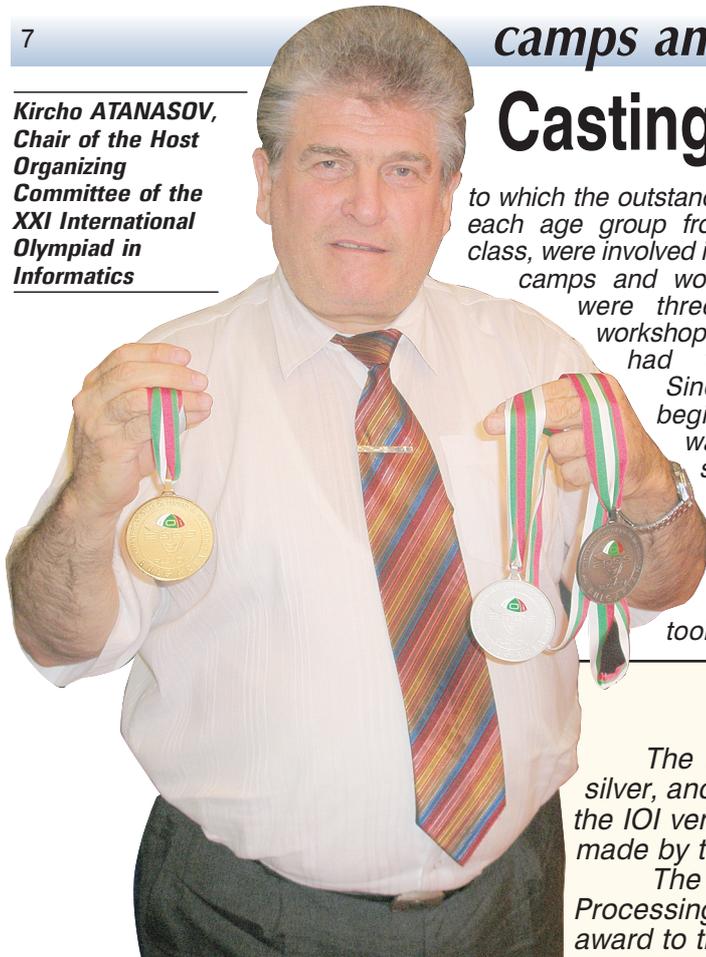


Pavel Azalov and Asen Rahnev in Prof. Pavel Azalov's home in Pennsylvania

seven years, for example, the Mathematical School in Plovdiv had special classes enrolling students from all over Bulgaria. Most of the top performers pursued their higher education at the University of Plovdiv, where some of them remained to pursue their careers. The team who is currently preparing the competition tasks for the XXI IOI is made up only of former IOI medalists: these 6 people have won 12 medals altogether.



Kircho ATANASOV,
Chair of the Host
Organizing
Committee of the
XXI International
Olympiad in
Informatics



Casting for champions

to which the outstanding students in each age group from 6th to 10th class, were involved in the network of camps and workshops. There were three camps and workshops a year and we had 11 altogether. Since the very beginning, there was a core of some 50 students, with still some 60-70 orbiting around them. The teams who took part in big

dates. Even now, on the national teams there are people who demonstrated their abilities at the very beginning. There are also others who grew up during all these years and developed their talents. A methodology was elaborated for conducting the sessions in the camps and workshops, as sport, excursions and interesting activities were provided for the kids in parallel. Another important aspect was the teachers who worked with them and their professional development.

A leading role in the organization of this process was played by Silvia Kantcheva - Chief Expert

The Awards

The medals for the winners - gold, silver, and bronze, have already arrived at the IOI venue in Plovdiv. They are custom made by the Mint of Bulgaria.

The International Information Processing Association will give a special award to the youngest medalist.

The contestant with most points will be the winner of the National Award of Egypt. This award was initiated in 2008.

A new insignia of honor for this competition is the John Atanasov - Junior Award, initiated as a counterpart of the President's John Atanasov prize given for scientific achievements in the field of Information Technology. The Junior version will be awarded for the most ingenious solution of the competition tasks. The prize winners will receive statuettes made by sculptor Tsvyatko Siromashki featuring elements of computer keyboard and a mask of John Atanasov.

When the decision was made in 2005 that the twenty-first Olympiad be held in Bulgaria, we felt a surge of elation. However, immediately after that, we buckled down to hard work considering how we should prepare the

teams in order to perform to expectations. There have always been special expectations of us - yet we initiated the international competitions in Informatics in 1989. Furthermore, 2009 would celebrate the 20th anniversary of the first international Olympiad. During all that time, our teams were always among the top performers, and our contestants came back home with medals.

We arrived at the conclusion that in the selection and preparation of the teams we had to apply an approach that was novel to us. It is well known that Bulgaria has a well developed system of competitions for school students in a number of subjects, including Informatics. The system was good and it worked, but we wanted to do something more. We elaborated a program according

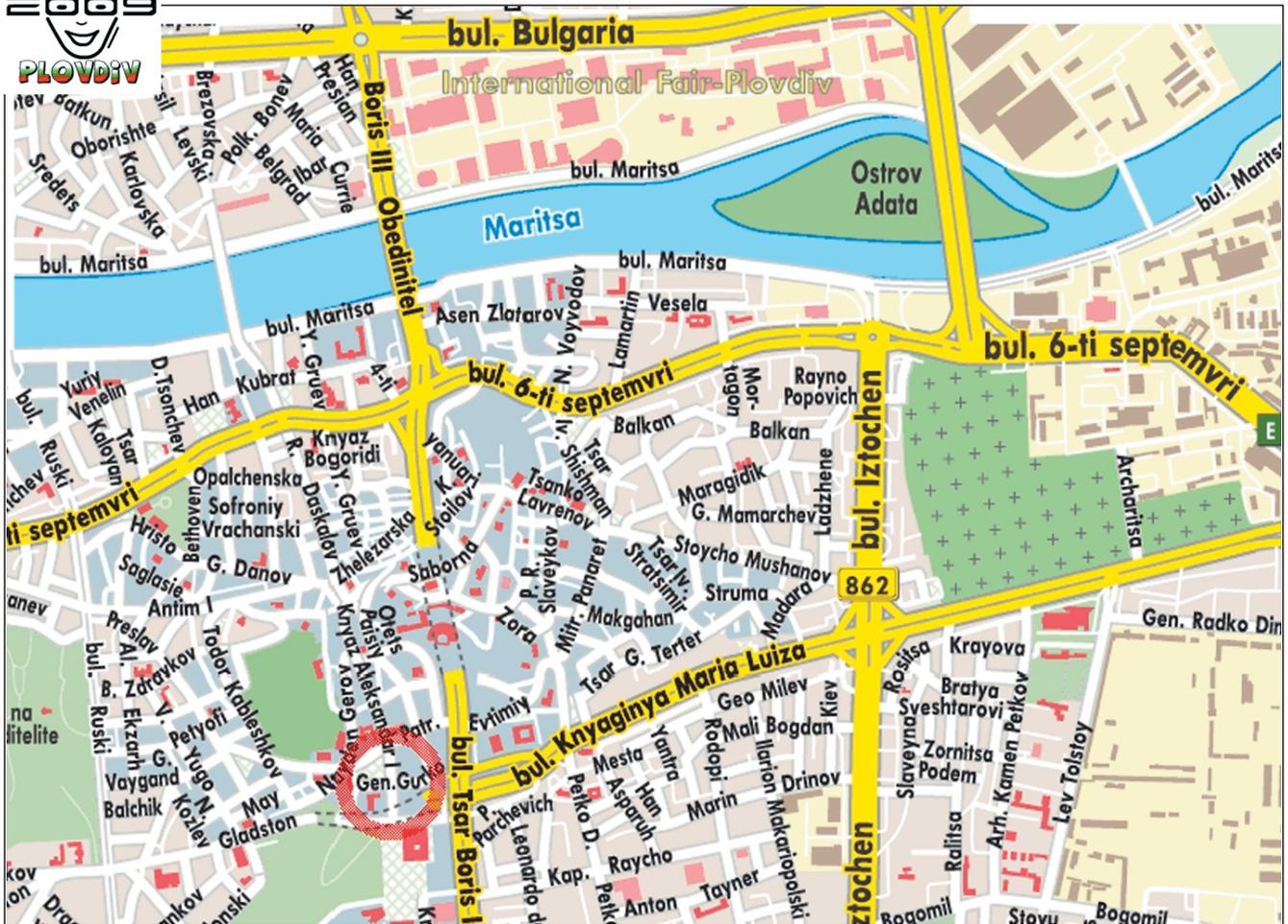
ANNIVERSARY

In addition to the traditional format of the competition, our forum includes the celebration of the 20th anniversary of the first IOI. Veterans from the first competition - team leaders, organizers, and Jury will be presented with special plaques. There will also be a commemoration spot featuring the first personal computers PRAVETS used by the team members of the 13 countries that took part in the first IOI in Bulgaria. The 21st IOI is attended by 83 participating countries.

competitions were selected based on the students' performance in the local competitions for a certain period of time, and there was a permanent competition among the candi-

in Informatics and Information Technology at the Ministry of Education and Science, under that name at the time. The academic managers of these 7-day camps and workshops had special assignments to elaborate the curricula and syllabi. I cannot, but name the person who had the most substantial input - Professor Stoyan Kapralov from the Technical University in Gabrovo. The

first camp and workshop was held on his ground, as the university contributed a lot in finetuning the underlying idea. We did our best to make sure that this model and the high level be maintained throughout the following „editions“ of the schools hosted by the Mathematical School in Smolyan, the Varna Free University, the Mathematical School in Blagoevgrad, the University of Ruse, the Mathematical School in Haskovo, the Burgas State University and last, but not least, by the newly founded National Centre for Gifted Children in Sofia. The Ministry of Education financed two camps and workshops a year, and the United States Agency for International Development covered the expenses for the third one.



Weather forecast for Plovdiv,
8-9-10 Aug 2009:
A mix of clear and cloudy skies with a chance of showers. Minimum temperatures 17-18 degrees Celcius, maximum temperatures 28-29° C.

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READING BULGARIAN

Cyrillic	Latin	Example	Cyrillic	Latin	Example
А, а	A, a	application	П, п	P, p	proof
Б, б	B, b	Boolean	Р, р	R, r	ring
В, в	V/U, v/u	value	С, с	S, s	set
Г, г	G, g	graph	Т, т	T, t	tensor
Д, д	D, d	denominator	У, у	U, u	book
Е, е	E, e	ellipse	Ф, ф	F, f	formula
Ж, ж	Zh, zh	division	Х, х	H, h	Dirichlet
З, з	Z, z	zero	Ц, ц	Ts, ts	results
И, и	I, i	integral	Ч, ч	Ch, ch	research
Й, й	Y, y	survey	Ш, ш	Sh, sh	shape
К, к	K, k	curve	Щ, щ	Sht, Sht	meshed
Л, л	L, l	lemma	Ъ, ъ	A, a	number
М, м	M, m	maths	Ь, ь	Y, y	assay
Н, н	N, n	number	Ю, ю	Yu, yu	Euclidean
О, о	O, o	order	Я, я	Ya, ya	yard

IOI NEWSLETTER TEAM:

Maya BUCHKOVA, Delyana LUKOVA,
 Lyuben BAKOV, Valeriya DEMERDZHIYSKA

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