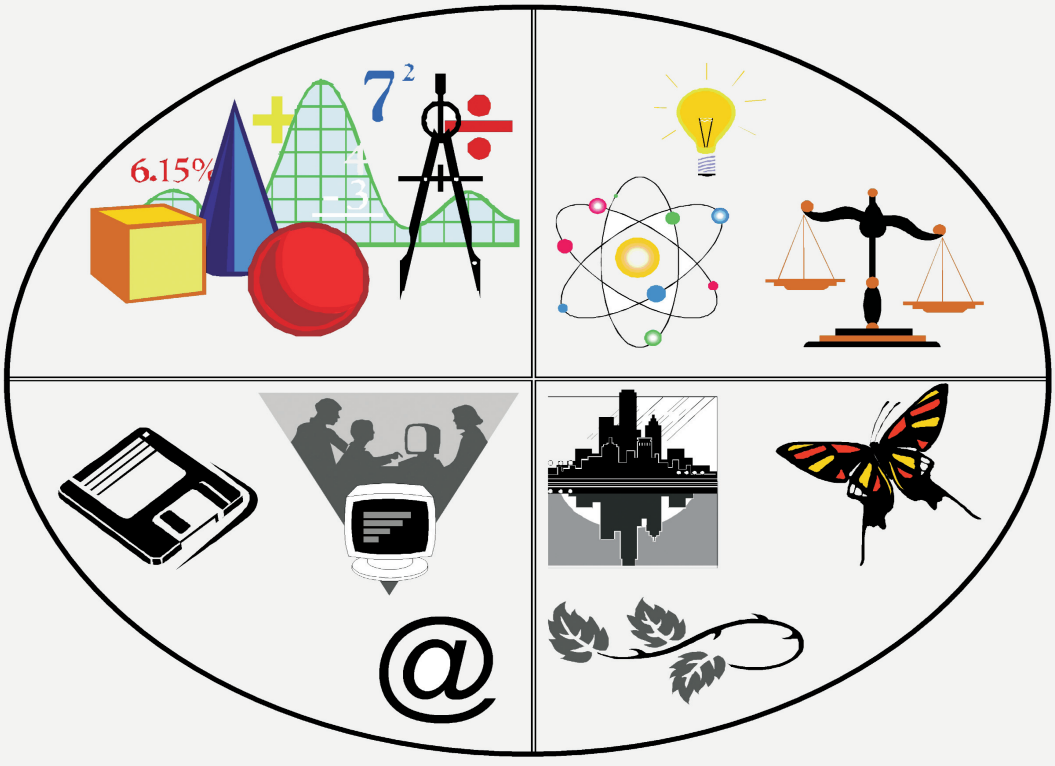
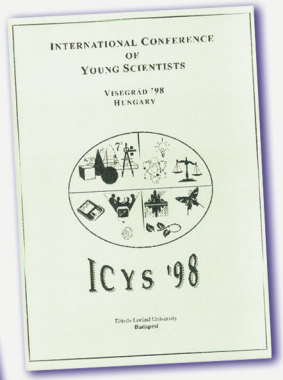
ICYS THE FIRST 15 YEARS

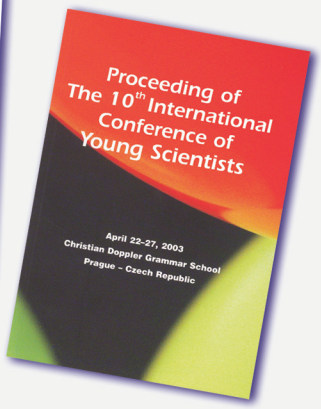


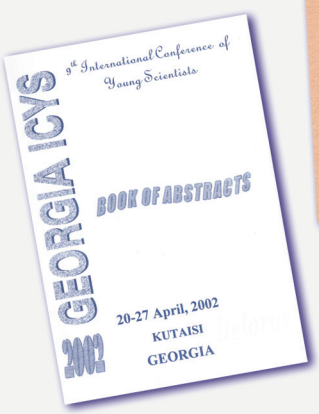
1994 2008


BOOK OF ABSTRACTS
International Conference for Young Scientists
VAN NOORD

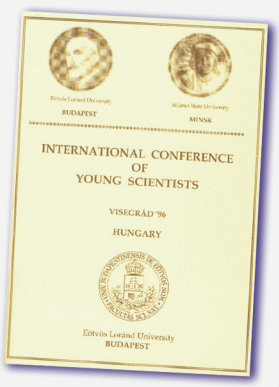

INTERNATIONAL CONFERENCE
OF
YOUNG SCIENTISTS
VISEGRÁD '98
HUNGARY
ICYS '98
Eötvös Loránd University
Budapest


ICYS
International
Conference of
Young Scientists
Heidehof
Stiftung
Stuttgart 2006
XIIIth IYCS - 18th to 23rd of April 2006 – Stuttgart/Germany
Teams from:
Belarus, Brazil, Croatia, Czech Republic, Georgia, Germany, Hungary, Indonesia, Lithuania, Macedonia, Netherlands, Poland, Russia, Ukraine
sponsored by BOSCH

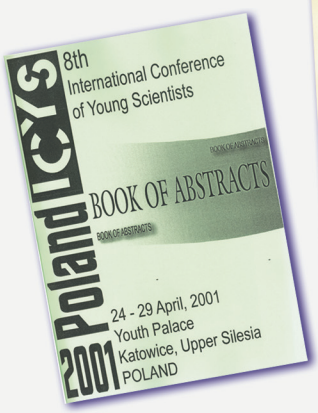

Proceeding of
The 10th International
Conference of
Young Scientists
April 22-27, 2003
Christian Doppler Grammar School
Prague – Czech Republic

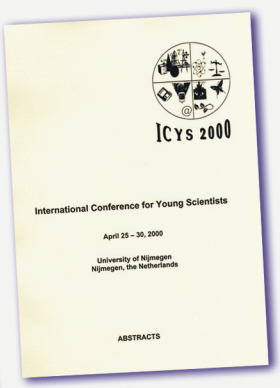

9th International Conference of Young Scientists
GEORGIA ICYS
BOOK OF ABSTRACTS
20-27 April, 2002
KUTAISI
GEORGIA
2002


XVth
International Conference
of Young Scientists
CHERNIVTSI - 2008
UKRAINE
18th to 23th of April 2008
Physics, Mathematics, Computer Science and Ecology
Belarus, Brazil, Croatia, Czech Republic, Georgia, Germany, Hungary, Indonesia, Lithuania, Macedonia, Netherlands, Poland, Romania, Russia, Ukraine
Sponsored by:
SVAROG
KOHTO

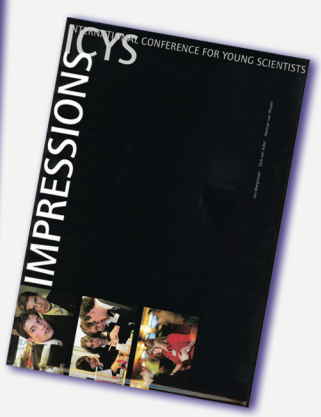

Eötvös Loránd University
BUDAPEST
Belarus State University
MINSK
INTERNATIONAL CONFERENCE
OF
YOUNG SCIENTISTS
VISEGRÁD '96
HUNGARY
Eötvös Loránd University
BUDAPEST


book of abstracts
ICYS
Poland

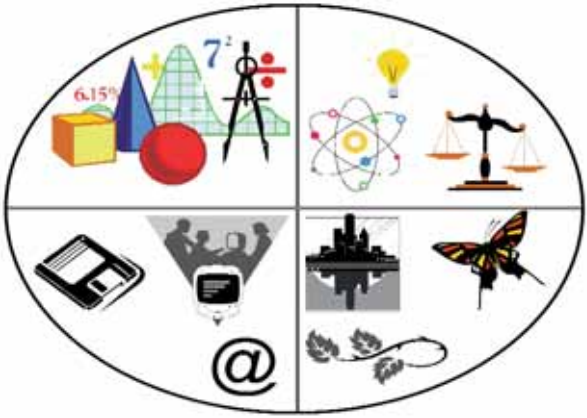

8th
International Conference
of Young Scientists
BOOK OF ABSTRACTS
BOOK OF ABSTRACTS
Poland ICYS
2001
24 - 29 April, 2001
Youth Palace
Katowice, Upper Silesia
POLAND


ICYS 2000
International Conference for Young Scientists
April 25 – 30, 2000
University of Nijmegen
Nijmegen, the Netherlands
ABSTRACTS


ICYS
International
Conference of
Young
Scientists
St. Petersburg 2001
ABSTRACTS


IMPRESSIONS
ICYS

ICYS THE FIRST 15 YEARS



1994 2008

Eötvös Loránd Tudományegyetem, Budapest

Felelős kiadó: Dr. Rajkovits Zsuzsanna
Szerkesztő: Dr. Rajkovits Zsuzsanna

The used data were prepared by local organizers.

Készült a Croatica Nonprofit Kft. gondozásában, 2009-ben.
Tördelőszerkesztő: Zámbóné Berencsi Katalin

Nyomás és kötés: MULTISZOLG Nyomda, Vác
Felelős vezető: Kajtor István

International Conference of Young Scientists

ICYS

Representatives ***of Eötvös Loránd University***, ***Budapest*** and the ***State University of Belarus, Minsk*** in 1993 decided to organize together a conference for 14-18 year-old secondary school students. The aim of the organizers with organizing such a new type of a competition was to acquaint secondary school students' with the methods of scientific research. This includes different stages of research work from the very beginning the pointing out the topic to the last step, summing up the results of the research in a foreign language-lecture. The conference gives a challenging opportunity to the young scientists to get some feedback of the work with which they are just trying to deal, and to measure their strength in an international field.

The International Conference of Young Scientists is a special type of competition in ***physics, mathematics, computer science and ecology*** for 14-18 year-old secondary school students. Every participant has to prepare a ***research report*** on a subject chosen by herself/himself from any part of the above mentioned sciences. The language of these ten-minute reports is English. An international jury evaluates and rewards the presentations. Three members of the jury usually are prominent representatives of the scientific life of the host country, and the additional ones scientists of participating countries.

The Conference is usually organized every year in April; the countries can get the announcement half year before the Conference. The ICYS from 2002 has website, which is constructed in Hungary. Important information in connection with the former conferences and the news of the organization of actual ICYS and links to the actual organizers can be found on that website. You can acquaint the Statutes and the Regulation of ICYS and through the photos of several Conferences you can feel the atmosphere of the competition too.

During 15 years history of the Conference students from the following countries have participated: Belarus, Greece, Romania, Yugoslavia, Macedonia, The Netherlands, Russia, Ukraine, Georgia, Slovakia, Poland, Singapore, Hungary, Germany, India, Cyprus, Finland, Czech Republic, USA, Indonesia. The conference was organized three times in Hungary (Visegrád, 1994, 1996, 1998), three times in Belarus (Baranavichi, 1995, 1997, 1999), twice in The Netherlands (Nijmegen, 2000, 2004) and in Poland (Katowice, 2001, 2005), in Georgia (Kutaisi, 2002), in Czech Republic (Prague/Kladno, 2003), in Germany (Stuttgart, 2006), in Russia (Saint-Petersburg, 2007) and last time in Ukraine (Chernivtsi, 2008).

Every year generally 60-70 lectures are delivered in 4 sections on the Conference, and the total number of participants, secondary school students and supervisors is annually 100-150 person.

The educational value of the competition

This kind of competitions has special importance in teaching the students: ***to do research work, to present and discuss their own results, to formulate research reports, to give presentation in foreign languages***.
This type of competition is very important from the point of view of the education of young talents. The ***working method*** of the students is similar to the methods of the research work in science. The preparation of the students for the competition requires a relatively long time, during which they need teacher's help ***in finding appropriate literature, in learning things which are not in the plan of physics education in the secondary schools, in the composition of the report, in making some experiments by devices which they do not have in their schools, in writing the article, ... etc.***
Perhaps most of the participating students will later become students at various universities and will be researchers reporting at scientific conferences, this first appearance may be a decisive factor in their future scientific career.
The conference is very important for the supervisors and teachers too, give them opportunity to exchange experiences in the dealing with the gifted students. Each country has its own method in the preparatory work, in the choosing of participating students on the international competition which methods have, of course relation with the popularity of this kind of competition in that country. Discussion with the colleagues is very useful for everybody. We can learn tricks from the popularization of the competition till the finding financial background of the participation and in organization of the Conference. The ICYS is member of the World Federation of Physics Competitions, which organization with its biannual congress an opportunity presents for further exchange experiences between supervisors of other competitions of different countries.
We have been following the walk of life of our students who had participated in ICYS, and now study at our university. They are able to join the research -work at the university and successfully participate in conferences, competitions for university students earlier then others. There can be found among them some students, who have many publications in famous international journals with high impact factor before finishing their studies at the university. Former competitors usually help us with pleasure in the preparing work; their scientific career serves as a good example for the younger university students.
During the competitions students make friends with competitors from other countries, this friendship can mean the beginning of a later scientific cooperation.
Nowadays, when the majority of the secondary school students do not have enough perspective in studying sciences, our work has greater importance. If we find only a few students for this job, it has already been worth of trying.

Leonid G. Markovich
State University of Belarus, Minsk, Belarus

Zsuzsanna Rajkovits
Eötvös University, Budapest, Hungary

STATUTES

INTERNATIONAL CONFERENCE OF YOUNG SCIENTISTS STATUTES

Name, Seat and Duration
Article 1
1. The foundation is named: “International Conference of Young Scientists”.
2. The foundation is domiciled in the municipality of Budapest, Hungary.
3. The foundation is established for an indefinite period of time.
4. The International Conference for Young Scientists is founded by the Eötvös Loránd University, Budapest, Hungary and the Belarusian State University, Minsk, Belarus.

Purpose
Article 2
1. The purpose of the foundation is:
   a) to popularize scientific research amongst school students;
   b) to stimulate the scientific careers of youngsters;
   c) to promote the communication and friendship between youngsters.

The foundation effectuates its purposes by organizing a conference every year at a location determined by the Steering Committee in accordance with the Local Committee.

Assets
Article 3
1. The foundation's assets exist of:
   a) contributions of participants;
   b) subsidies and donations;
   c) endowments, heirlooms, and specific legacies;
   d) compensations for the activities as set out in article 2, paragraph 2;
   e) all other incomes and acquisitions.

Committees
Article 4
The foundation knows several committees.
1. The Steering Committee can establish committees with a specific task, according to the rules prescribed in the regulations. Regulations relating to composition, tasks and competence of each committee need to be arranged by the general meeting before the appointment of the committee's members.
2. According to the rules laid down in the regulations, every year a Local Committee is established.

Steering Committee
Article 5
1. The foundation’s Steering Committee consists of at least three members and is appointed by this deed for the first time. At least one member of the Steering Committee shall be a representative of the Eötvös Loránd University Budapest, Hungary and at least one member shall be the representative of the Belarusian State University, Minsk, Belarus. The number of Steering Committee members will be determined by the Steering Committee unanimously, with due observance of the provi-

sion set out in the previous sentence. To be elected as member of the Steering Committee, members should be available for at least one year.
2. The Steering Committee embodies a president, a secretary, and a treasurer. One person can not carry out more than one function.
3. When one (or more) vacanc(y)(ies) occur(s) as a result of the departure of (a) member(s) of the Steering Committee a meeting of the Steering Committee will fill this vacancy by electing one (or more) successor(s).
4. If one or more Steering Committee member(s) are/is missing, for whatever reason, the remaining Steering Committee member(s) will nevertheless form a legal entity.
5. Steering Committee members are being appointed for a period of four years.
6. Outgoing members of the Steering Committee can be re-elected immediately. A member elected for an interim vacancy will retire by rotation at the time prescribed for the person replaced.

Steering Committee meetings and decisions
Article 6
1. Steering Committee meetings can only be convened by the President or by two other Steering Committee members together, as often as he/she/they think is necessary.
2. A written notice to convene a meeting is sent to the addresses of the members of the Steering Committee.
3. Every year a Steering Committee meeting is held. This annual meeting is held not later than six months after the end of the fiscal year. During this annual meeting, the following subjects will come up for discussion:
   a) the annual report and accounts, as referred to in Article 12;
   b) vacancies, if any;
   c) proposals as announced in the written notice.
4. The Steering Committee meeting is chaired by the president. If the president is missing, the meeting will appoint a president.
5. Unless otherwise provided by the articles of association or by law all resolutions of the meeting of Steering Committee members will be adopted by an absolute majority of the votes cast.
6. Votes will be cast orally, unless the president or another person holding the right to vote considers a vote by ballot more desirable.
7. As long as all members of the Steering Committee are present or attended by proxy, valid resolutions can be adopted on condition that these resolutions are adopted unanimously.
8. Resolutions adopted can concern any submitted subject — also proposals on amending the articles of association or to dissolve the foundation — without issuing a notice in advance or dealing with other prescribed manners and formalities concerning the convening of meetings.
9. The Steering Committee can also adopt resolutions without holding a meeting, on the condition that all Steering Committee members are provided an opportunity — in writing or by any other means of communication — to voice their opinion. If a resolution is adopted in this manner, the secretary will draw up a report of the statements. This report will be included in the minutes, after being co-signed by the President.

Authority and representation of the Steering Committee
Article 7
1. The Steering Committee is responsible for managing the foundation.
2. The Steering Committee is authorized to decide to enter into agreements of acquisition, alienation and encumbrance of register properties.
3. The Steering Committee is also authorized to decide to enter into agreements, whereby the foundation binds itself as a surety or commits itself as a joint or several debtor, or to warrant performance by a third party or to provide security for a debt of an other party.

4. The Steering Committee will supervise the proper conduct of the Conference in accordance with the Local Committee (LC).
5. The Steering Committee will establish the rules and guidelines for the proper conduct of the Conference i.e. establish guidelines for the members of jury and for the presentations;
6. The Steering Committee will determine the scientific fields;
7. The Steering Committee will appoint, in accordance with the LC, the teams that will participate in de Conference.

Representation
Article 8
1. The Steering Committee represents the foundation at law and otherwise.
2. The authority to represent the foundation also belongs to two Steering Committee members, when acting jointly.
3. The Steering Committee can authorize one or more Steering Committee members to represent the foundation as well as a third party.

Termination of membership of the Steering Committee
Article 9
1. Membership of the Steering Committee terminates:
   a) by periodical resignation,
   b) on the death of a Steering Committee member,
   c) when a Steering Committee member is placed under tutelage,
   d) by written resignation (retirement),
   e) when a member ends its participation in the foundation.

Fiscal year, annual report and accounts
Article 10
1. The fiscal year of the foundation runs from the first of July up to and including the thirtieth of June of every following year.
2. Within six months after the end of every fiscal year, the treasurer will draw up the balance sheet (annual report) and the annual accounts. The annual report and accounts will be signed by all Steering Committee members if found correct.
3. The Steering Committee can have the annual report and accounts audited by a chartered accountant.

The Local Committee
Article 11
1. The Local Committee determines, in accordance with the Steering Committee, in the period from April till June the data of the Conference for which they are responsible.
2. The Local Committee fixes, in accordance with the Steering Committee, the maximum number of participants in the Conference.
3. The Local Committee is responsible for the organization and the proper conduct of the Conference.

The teams
Article 12
1. Every invited party is represented by one team.
2. Each party consists of at most five students and two delegation leaders.
3. Normally the students of the teams are the winners of national or regional competitions.
4. At the dates of the Conference the students have not entered any kind of higher education nor will their age exceed 20 years.

5. The hosting country can be represented by at most two teams.
6. All countries who participated during the past three years in de Conference have the right to be invited to be present with a team.

Regulations
Article 13
1. The Steering Committee is authorized to draw up regulations concerning all subjects that are not contained in these regulations.
2. Complementary regulations made by the Steering Committee may not be in conflict with the Law or the regulations.
3. The Steering Committee is authorized to abolish or to amend the regulations.
4. Drawing up regulations as well as amending or abolishing the regulations is possible after application of what is set out in Article 15, paragraph 1.

Amendment to the articles of foundation
Article 14
1. The Steering Committee is authorized to, when approved with a two-third majority to amend the regulations and to let the foundation merge within the meaning of the law, with another legal person. These resolutions can only be adopted unanimously during a meeting where all members of the Steering Committee are present or attended by proxy without there being a vacancy.
2. Amendments to the articles of foundation need to be established by notarial deed on penalty of being nullified.

Dissolution and Liquidation
Article 15
1. The Steering Committee is authorized to, with a two-third majority of the votes cast, dissolve the foundation, with application of what is stipulated in Article 15, Paragraph 1.
2. The foundation will continue to exist after dissolution, to make liquidation of the foundation's assets possible.
3. Liquidation is effected by the Steering Committee, unless the Steering Committee appoints a third party as a liquidator.
4. The provisions laid down in these regulations need to remain in effect as much as possible during liquidation.
5. In case of a credit balance the foundation's money will be spent in accordance with the purpose of the foundation.
6. At the end of the liquidation all record and document of the foundation will de deposited with the youngest liquidator during ten years.

Final stipulation
Article 16
1. In cases not provided for by the regulations or by Law the Steering Committee decides. The Steering Committee needs to render account of its decisions to the members.
2. Finally, the person appearing declared that the following persons will be appointed to the Steering Committee for the first time:
   a) Zsuzsanna Rajkovits (Eötvös University, Budapest, Hungary), as president;
   b) Leonid Markovich (Belarusian State University, Minsk, Belarus) as vice-president;
   c) Hans Jordens (University of Groningen, Groningen, The Netherlands), as member;
   d) Andrey Timoshchenko (International Sakharov Environmental University, Minsk, Belarus), as member;
   e) President of Local Organizing Committee of the host country, as member.

Steering Committe of ICYS in 2008

Zsuzsanna Rajkovits (Eötvös University, Budapest, Hungary), president;

Leonid Markovich (Belarusian State University, Minsk, Belarus) vice-president;

Hans Jordens (University of Groningen, Groningen, The Netherlands), vice-president;

Andrey Timoshchenko (International Sakharov Environmental University, Minsk, Belarus) member;

Urszula Woznikowska-Bezak (Youth Palace, Katowice, Poland) member;

Alexander Urban (Heidehof – Stiftung, Stuttgart, Germany) member;

Péter Kenesei (Eötvös University, Budapest, Hungary) secretary;

President of the Local Organizing Committee of the host country, member.

REGULATIONS

INTERNATIONAL CONFERENCE OF YOUNG SCIENTISTS REGULATION

General
Article 1

1. The International Conference of Young Scientists (ICYS) is essentially an individual competition on scientific research and presentations carried out by school students which are evaluated by the International Jury.
2. At the dates of the Conference the students have not entered any kind of higher education nor will their age exceed 20 years.
3. The following table gives an overview upon the allowed combinations of numbers of students, presentations and team-leaders of a team:

Students	Presentations	Team-leaders
2	2	1
3	2 or 3	1
4	3 or 4	1 or 2
5	3 to 5	1 or 2
6	4 to 6	1 or 2

Each country may send normally 1 team. If there is still space for more teams after a given dead-line, countries may send 1 or 2 further teams but in total at most 12 students. Countries who are interested in sending a team and who had no contact with ICYS yet at first should send an observer to the next ICYS.

The Local Organizing Committee
Article 2

1. The first announcement of the ICYS shall be published not later than half a year before the date of the ICYS.
2. The first announcement shall contain information about the location and data of the Conference as well as deadlines for the submission of the contributions and guidelines.
3. Local Organizing Committee (LOC) shall, in accordance with the Steering Committee (SC), invite national and/or regional organizations to nominate participants of the ICYS.
4. The LOC can set limits to the number of participants and presentations.
5. The LOC guarantees proper conditions for all the participants and shall provide audio-visual means in order to assure the best possible presentations by the participants.
6. The LOC is allowed, in accordance with the SC, to invite new parties for the ICYS.
7. The LOC shall, in accordance with the SC, appoint a competent International Jury able to evaluate the presentations during the ICYS.
8. The LOC shall provide awards for the winners of the ICYS.
9. The LOC shall provide guidelines to assess the presentations. These guidelines shall normally involve such items as:
   a) statement of the problem
   b) justification of methods and techniques applied by the lecturer in order to solve the problem
   c) results and conclusions.
   These guidelines shall be published on the central web site of the ICYS.

10. In addition to what is stipulated in the Statutes the LOC shall provide a cultural program for all the participants during the ICYS.

Submission of abstracts
Article 3
1. Abstracts of the presentations shall be submitted to the LOC by digital means and, if possible, in writing prior to a deadline fixed by the LOC.
2. The division of the presentations shall be made according to the following fields:
   a) Physics
   b) Mathematics
   c) Computer Science
   d) Environmental Sciences
   e) Engineering
   f) Life Sciences
   The LOC, in accordance with the SC, can arrange an additional field.
3. In order to make a proper division, the submitted abstracts shall be judged by the LOC.

Presentations
Article 4
1. The working language of the ICYS is English.
2. Only one of the authors shall present the research work.
3. The presentations shall reflect the results of research that is dominantly archived by the lecturer alone or in collaboration with other school students.
4. Every presentation should last not longer than 15 minutes. Extra time for the preparation may be allowed by the head of the jury.
5. Questions can be put to the lecturer after the presentation during a limited time fixed by the head of the jury.
6. Normally the LOC shall ensure one prize and one certificate per awarded presentation. The LOC shall provide different certificates for the co-authors.

The International Jury
Article 5
1. The International Jury is appointed by the LOC in accordance with the SC.
2. In each field the majority of the members of jury shall be independent.
3. The members of the International Jury shall be experts in the corresponding field.
4. The jury for each field shall consist of at least five members. The jury shall not be changed during the ICYS.
5. In each field of ICYS the LOC, in accordance with the SC, appoints the head of the jury.
6. The members of Jury shall evaluate the presentations individually by allotting marks between 1 and 10 according with the following scheme:
   a) very poor: 1 or 2
   b) poor: 3 or 4
   c) satisfactory: 5 or 6
   d) good: 7 or 8
   e) excellent: 9 or 10
7. The evaluation of the members of Jury shall be done consistent to the guidelines provided by the LOC. The head of the jury may ask members of the jury to clarify their marking.
8. The score for every presentation is the algebraic sum of the marks of the members of jury. When the jury consists of six or more members the lowest mark is left out. In addition to this the highest mark is left out when the jury consists of seven or more members.

Preparatory Seminar, September 2002, Visegrád, Hungary
Formation of the Statutes and the Regulation

Preparatory Seminar, August, 2005, Krašići, Montenegro
Correction of the Statutes and the Regulation

Greetings of the colleagues at Eötvös University

Work in Visegrád

Visegrád, Hungary, 1994

President of the LOC: ***Dr. Zsuzsanna Rajkovits***

Visegrád

Participating countries: **6**
Belarus, Russia, Ukraine, Romania, Hungary, The Netherlands (observer)

The number of participants: **140**
Number of students: **75**
Number of leaders, supervisors: **45**
Number of presentations**: 73** (Physics: 32, Mathematics: 20, Computer Science: 21)

RESULTS

• Physics

The best student:	**Eugenia Vishnyevskaya** (laurate)	Moscow	Russia
I. prize:	**Svetlana Kabibulina**	Ufa	Russia
II. prize:	**Nóra Szász**	Budapest	Hungary
	Olga Archipova	Saint-Petersburg	Russia
	Yury Vetyukov	Saint-Petersburg	Russia

III. prize:	**Anton Gusakov**	Minsk	Belarus
	Dmitry Yourdanov	Stavropol	Russia
Special prize:	**Sergey Zhuk**	Chernivtzy	Ukraine
	(for the best work in physics teaching technology)		

Jury: ***Prof. George Marx, Prof. István Kovács, Prof. Péter Gnädig,*** Hungary, ***Dr. Hans Jordens,*** The Netherlands, ***Prof. Valentin Lobishev,*** Russia, ***Prof. Anatoly Slobodyanyuk***, Belarus

• Mathematics

The best student:	**Kamotsky Vladimir**	Saint-Petersburg	Russia
I. prize:	**Gurin Sergey**	Saint-Petersburg	Russia
II. prize:	**Ivánka Gábor**	Arad	România
	Maslov Dmitry	Moscow	Russia
III. prize:	**Ordin Andrey**	Moscow	Russia
	Kuzora Igor	Moscow	Russia,
	Környei László	Győr	Hungary
Special prize:	**Deák Ferenc**	Budapest	Hungary
	(for the most elegant presentation)		

Jury: ***Prof. Hortobágyi István***, ***Dr. Gonda János, Dr. Sövegjártó András***, Hungary, ***Egorov Andrey*** KVANT Journal, Russia, ***Dubrovsy Valery,*** Russian Physical Society, Moscow, ***Dr. George Krylov,*** Belarus

• Computer Science

The best student:	**Shaposhnik Roman**	Saint-Petersburg	Russia
I. prize:	**Oleynik Sergey**	Minsk	Belarus
II. prize:	**Zacharov Vasily**	Moscow	Russia
	Stolyar Stanislav	Saint-Petersburg	Russia
	Gavrilov Artyom	Minsk	Belarus
III. prize:	**Belov Gleb**	Ufa	Russia
	Duzyan Ruslan	Chernivtzi	Ukraine

Jury: ***Dr. Csákány Antal, Dr. Bagyinszki Anna, Dr. Temesvári Tibor,*** Hungary, ***Dr. Valery Uzdin,*** Russia, ***Dr. George Krylov***, Belarus

Jury of the Physics section

One of the most interesting presentations

The magic of ice

Khabibullina Svetlana
Ufa, Russia

Introduction

The Ice Magic is mostly meant phenomenon revealed by the English scientist Bottomly in 1872. The essence of the phenomenon is the follow.

A wire with a load gradually cuts ice but the cut closes again with ice after the wire passes through it. As a result the ice remains uncut *(Fig. 1.)*.

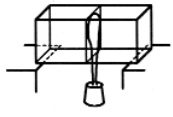


Fig. 1.

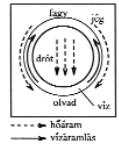


Fig. 2.

The phenomenon is explained in the following way. Ice which lies directly under the wire takes up pressure the freezing temperature falls and the ice melts. Water formed by melting flows around the wire's surface and congregates on its top *(Fig. 2.)*.

But the wire does not bring pressure on ice there that is why the water freezes again. On the other side latent heat is given off during the refreezing. This heat is transmitted to the lower surface of the wire by the wire itself and by ambient ice. The lower surface supplies heat and melts ice still further under the wire. After the water flow and heat transfer have taken on stationary regime the wire moves through ice with constant speed.

American scientists Nye (Bristol University) as well as Drake and Shreve (California University) have formulated a quantitative theory of regelation of ice (Nye J.F. Theory of regelation, Phil. Mag. 16. 1249, 1967, Drake L.D. Pressure melting and regelation of ice by round wires, Proc. Roy. Soc. London, A332. 51, 1973). They considered two cases; with copper wire and with Capron thread. In the case of wire the heat given off by freezing the upper layer of water will be conducted to the lower surface of the wire because of the good heat conduction of copper and the process of ice cutting will be fast. In the case of Capron thread with bad heat conduction heat will be conducted mainly by ice and the process of cutting will proceed slowly.

The literature I had at my disposal gives only qualitative description of the process but I have never met any quantitative assessment of the speed of the wire movement. Therefore it was interesting to assess the speed theoretically and first-hand to carry out an experiment and to compare my results with the results of the American scientists.

Theoretical description

Let us consider the ice melting under the wire. We can explain it with the help of the diagram of water states *(Fig. 3.)*.

Let us consider the melting curve (B) at the temperature about the zero degree C.

It follows from the diagram

$$\Delta p = -\sigma \Delta T. \tag{1}$$

In our case the freezing point under the wire falls because the wire brings pressure on ice. Le tus define this pressure. The pressure on the top of the wire is equal p_0, and the pressure below consists of the p_0 and the load's pressure *(Fig. 4.)*.

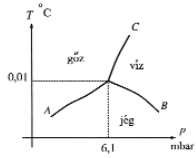


Fig. 3.

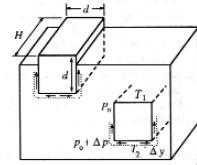


Fig. 4.

$$p = \frac{Mg}{A} = \frac{Mg}{Hd} \tag{2}$$

Where M is the mass of load H is the width of the wire lying on t he ice d is the diameter of the wire. (Fort he simplification of the calculation we consider a wire with square cross-section).
The pressure difference:

$$\Delta p = p. \tag{3}$$

The heat arised from the freezing is transmitted by the wire to the lower part of it. Le tus determine the heat flows from the upper part of the wire to the lower one during the Δt time interval:
According to the Fourier law the heat is:

$$Q_1 = -\lambda A \frac{\Delta T}{\Delta x} \Delta t. \tag{4}$$

Expressed by the data of wire, the heat is:

$$Q_1 = -\lambda \frac{Mg\Delta t}{\sigma d} \Delta t, \tag{5}$$

where $x = d$, $A = Hd$, $T = {}^{Mg}/_{Hd\sigma}$.

This heat melts the $A\Delta\gamma$ volume of ice under the wire *(Fig. 4)*.
To melt the ice the needed heat is:

$$Q_2 = \Delta mL = \rho \Delta \gamma AL, \tag{5a}$$

where ρ is the density, L is the specific heat of melting of the ice respectively.

Since $Q_1 = Q_2$ and $\frac{\Delta y}{\Delta t} = v$, the velocity of the movement of the melted surface, finally we have obtained:

$$v = \frac{\gamma Mg}{\sigma dH\rho L}. \tag{6}$$

Results of calculation

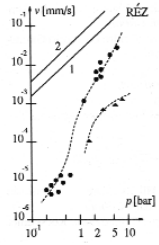


Fig. 5.

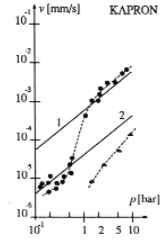


Fig. 5a

On the *Fig. 5.* is represented the velocity-load relation for copper wire *(Fig. 5a)* and for the Capron thread respectively.
The 1 line represents the Drake and Sreve's theory, the 2 line is in accordance with the above formula for the velocity. The two graphs are different because of the wire geometry, the heat conductivity and other parameters are not the same.
Buti t should be noted that the two lines are parallel; it means that the character of the process has been described correctly. A simple consideration is in a good agreement with the complex thermodinamical theory of Nye.

Experimental results
We would like to note that our experiment have a qualitative character because it was difficult to control the required temperature between 0 and 0.1 degree C. The experiment was done between 0 °C and –5 °C temperature. The wire with $d =$ 0.55 mm in diameter and $H =$ 100 mm in length was investigated by the load 1 kg, 2 kg, 3 kg, 4 kg respectively. The data of the Capron thread: $d =$ 0.25 mm and the load were 0.5 kg, 1.0 kg, 1.5 kg and 2.5 kg.
The pressure has been calculated by the formula (2).
The experimental data of the American scientists are marked by circles and our data by triangles. Our experimental velocities are 10 times smaller than the experimental data in the mentioned literature. That difference can be because of the smaller accuracy of the measuring of the temperature. When the temperature during the experiment was less than –0.1 °C, the pressure was not enough big to melt the ice under the wire, the process stopped. If the temperature was increased the process was restored.
The process of the regelation of ice seems easy to explain but it is a very complex process in reality. The mentioned American scientists have already found discrepancy between the theory and the experimental data, which discrepancy is obvious during the loading by small masses. When the load being 1 bar the velocity of wire rises very quickly, the movement is about 50 times faster. The reason of this difference now is not known.
In the case of the Capron thread the calculated speed of the thread movement is less, but there is discrepancy too between the theory and the experimental data.
It seems the theory is not perfect at the moment. The reason of the discrepancy between the theoretical description and the experiments can be presence of air bubbles in the ice or the roughness of the surface of the wire. In the model for the calculation we used constant thickness for the water sheet between the ice and wire surface. The magnitude of this thickness is nearly mm. According to the Frank's theory such sheets are energetically unstable. That fact can slow down the heat transfer. Another reason can be the viscosity of the water. The dragging of the water could have been taken into consideration in the calculation because of the too small thickness of the wire. At the end we can concluded that although the regelation of ice seems as a simple phenomenon until now there is no an exact theory to explain the experimental results.

Literature
N. Maeno: "The science abou ice", MIR, Moscow, 230 (1988)

This article was published after the ICYS 1994 in November in the Hungarian journal for physicists „Fizikai Szemle", in the issue XLIV./11, 447-448, (1994), in the sectiont of Students' Forum, as "The magic of ice".

The best student

The mechanism of gas breakdown and the process of gas discharge int he flash lamp

Eugenia Vishnevskaya
Secondary school of Moscow State University
Moscow, Russia

The gas discharge in the impulse flash lamp is considered in details. The mechanism of the electric breakdown of gas and the transformation of the energy of the capacitor into radiation are investigated. The breakdown voltage, the electric current through the lamp, and the intensity of radiation were measured experimentally. A theoretical description using our model of gas discharge was carried out too in our research.

Entertainment

Awarding

Excursion to Budapest

On the Square of Heroes in Budapest

Fisherman Bastion in Budapest

Baranavichi, Belarus, 1995

President of the LOC: ***Leonid G. Markovich***

Participating countries: **4**
Belarus, Hungary, Russia, Ukraine
Number of participants: **56**
Number of students: **27**
Number of leaders: **17**
Number of presentations: **23** (Physics: 10, Environmental Sciences: 4, Mathematics: 4, Computer Science: 5)

Opening Ceremony

RESULTS

• Mathematics

I. prize:	**Zaupper Bence**	Győr	Hungary
	Zmejkov David	Minsk	Belarus

Jury: ***Mazanik Sergey, Zadvorny Boris, Barabanov Evgenij***, State University of Belarus, Minsk, Belarus

• Physics

I. prize:	**Farkas Illés**	Budapest	Hungary
II. prize:	**Ivády Gabriella**	Dunaújváros	Hungary
	Mironov Dmitrij	Minsk	Belarus
	Igor Waraksa	Minsk	Belarus
III. prize:	**Kotov Oleg**	Minsk	Belarus

Jury: ***Slobodjaznjuk Anatoli***, ***Lavrinenko Andrey, Markovich Leonid, Ilutenko Alexey***
State University of Belarus, Minsk, Belarus,
Lajos Skrapits, Zsuzsanna Rajkovits, Eötvös University, Budapest, Hungary

Presentations

A part of the jury

• Environmental Sciences

I. prize:	**Bukovinszky Tibor**	Érd	Hungary
	Grichik Oksana	Minsk	Belarus
	Menyhért Judit	Budapest	Hungary
II. prize:	**Martus Melinda**	Csongrád	Hungary

Jury: ***Andrei Timoshchenko,*** Saharov Environmetal University, Minsk, Belarus, ***Zsuzsanna Rajkovits***, Eötvös University, Budapest, Hungary

Acidification in Hungary

Martus Melinda
Csongrád, Hungary

The growth of the human activity's intensity experienced in the last decades leads to disorganisation of the established order of nature. Unfortunately this brings up many environmental protection problems. I prepared my report in connection with this about the situation in Hungary.

I. Evolution of the acid rains
It has been known long ago the evolution of acid rains the atmosphere's trace-gases containing sulphur and nitrogen is responsible. Because of the atmosphere's carbon-dioxide and the trace elements getting to the atmosphere on the natural way the precipitation would be not neutral. It would be acidic rain even without human intervention.

According to the calculations, even that would not be problem (from the point of view of the acidification), if the anthropogenic air polluters and the natural materials would be released on the Earth's surface almost equally.
This means that the human intervention is added to a base. However this can be 5-20 times more than natural.
In 1985 it signed an agreement in Helsinki with twenty countries it decreases its sulphur – dioxide emission of the year 1980 with 30% until 1993. In Hungary it was fulfilled. In the years past, the quantity of the sulphur-dioxide getting into the air decreased with 30%, but in absolute value it is still high.

II. Taking precipitation samples
We used a network of automatic sample-collectors. These collectors in a precipitation-free period are closed, this way the direct effect of the dust originating from the soil and other polluting sources are eliminated. Presently there are ten measuring places in Hungary in the operation of the Institute for Atmosphere-physics.

III. Measuring the acidity and results
The most simple and most usual way of determining the acidity is measuring the pH. We collect the samples during a whole year. We investigated the acidification of waters, of the soils and in the Forest.
Waters: In the waters the signs of the acidification can not be detected. The chemical reaction is basic; the value of the pH is higher, then 7.
Soil: Fertility of the soil is determined by the totality of the soil characteristics. The chemical reaction of the soil is very important. The pH of the Hungarian soils is different, but almost everywhere is acidic.



Entertainment



The Hungarian delegation


Visegrád, Hungary, 1996

President of the IOC: ***Dr. Zsuzsanna Rajkovits***

Our hotels

Participating countries: **9**
Belarus, Ukraine, Russia, Romania, Georgia, Greece, The Netherlands, Yugoslavia, Hungary
Number of participants: **150**
Number of students**: 90**
Number of leaders: **50**
Number of presentations: **85** (Mathematics: 24, Computer Science: 11, Physics: 32, Ecology: 18)

Opening ceremony

RESULTS

• Computer Science

I. prize:	**Tosić Milos**	Belgrade	Yugoslavia
	Yatsishin Anton	Chernitsi	Ukraine
II. prize:	**Milnevich Ivan**	Minsk	Belarus
III. prize:	**Bačić Marko**	Belgrade	Yugoslavia
	Grigorchuk Ruslan	Chernivtsi	Ukraine

Jury: ***Prof. János Csirik, Bércesné Dr. Ágnes Novák***, ***Turcsányiné, Dr. Márta Szabó***, ***Dr. Gyula Mentler,*** Hungary, ***Dr. George Krylov***, Belarus

• Physics

I. prize:	**Tselobyonok Alexander**	Minsk	Belarus
	Szőcs Géza	Tirgu Secuiesc	Romania
II. prize:	**Kardos Marica** and		
	Nemes Ágnes	Túrkeve	Hungary
	Reznyikov Dmirii	Kiev	Ukraine
III. prize:	**Elioukina Olga**	Saint-Petersburg	Russia
	Evdokimenko Artyom	Moscow	Russia
Special prize:	**Razis Demetrios** (13 years)	Egion	Greece

Jury: ***Prof. István Kovács, Prof. Péter Gnädig, Prof. Péter Tasnádi***, Hungary, ***Prof. Anatoly Slobodjanyuk*** Belarus, ***Prof. Vasily Razumovsky,*** Moscow, Russia, ***Dr. Hans Jordens,*** The Netherlands

Physics section

• Mathematics

I. prize:	**Vanne Julian**	Mogilev	Belarus
	Dobrinyin Sergey	Saint-Petersburg	Russia
II. prize:	**Arros Orsolya**	Odorheiu-Secuiesc	Romania
	Kozlov Alexey	Saint-Petersburg	Russia
III. prize:	**Gendelev Michail**	Saint-Petersburg	Russia
	Stošić Marko	Belgrade	Yugoslavia
Special prize:	**Skoulatos Marcos**	Egion	Greece

Jury: ***Prof. István Hortobágyi, Ruslan Farsan,*** Hungary, ***Prof. Boris Zadvornij,*** Belarus, ***Andrey Yegorov,*** Moscow, Russia

Mathematics section

• **Ecology**

I. prize:	**Sata Viktor**	Miercurea Ciuc	Romania
	Vishnevskaya Julia	Gomel	Belarus
II. prize:	**Darvasi Melinda**	Cluj-Napoca	Romania
	Menyhért Judit	Budapest	Hungary
III. prize:	**Duritskaya Inna**	Chernivtsi	Ukraine
	Osztovits János and **Zádor Judit**	Budapest	Hungary

Ecology section

Jury: ***Prof. George Marx, Prof. Judit Bartholi, Dr. Enikő Varga, Prof. József Borossay***, ***Dr. Miklós Persányi*** (Hungarian Zoo), ***Prof. Valentin Lobishev*** Russia, ***Prof. Andrey Timoshchenko*** Belarus

Abstracts of some winner's presentations

Computer Science

Implementation of algorithms for real-time 3D computer Graphics

I. prize
Tošić Miloš

The High School of Mathematics
Belgrade, Yugoslavia

In this paper several subjects concerning algorithms for very fast computer 3D graphics are considered. In the first part some basics such as projection of a point to the screen, rotation of a vector, polygon filling, polygon clipping are described. Further, more advanced techniques are explained, like fast colour determination, flat shading gouraud shading, texture mapping, gouraud-texture mapping, phong shading, real colour dithering, etc..
All programming is written in pseudo code for easier understanding of the basic idea. Finally, there is a chapter about optimising the whole 3D engine. PC assembler optimisation is also considered: using integer arithmetic's (instead of floating points), self-modifying code, register saving and preserving, some hardware VGA tricks etc..

Mathematics

Use of hyperbolic functions in solving the Pell's equation and the application at numbers theory

III. prize
Stošić Marko

The High School of Mathematics
Belgrade, Yugoslavia

In this paper we show the application of hyperbolic functions in solving some difficult tasks out of the Numbers Theory.
In the first introduction part we describe geometric solving of the Pell's equation. There is also a task solved in the classic way, what appeared at the Hungarian Mathematics Olympiad in 1969.
In the second part we describe basic theorems about hyperbolic functions, as well as some theorems connecting them with natural numbers.
In the third part we give the description of solving the Pell's equation using hyperbolic functions. We also illustrate the application of hyperbolic function in the Numbers Theory through examples given.
Finally we solve the task from the introduction part using the previously mentioned method.

Ecology

Thimectomised mice NMRI as a model of acquired immunodeficiency

III. prize

Duritskaya Inna

Gymnasium N35
Chernivtsi, Ukraine

As immune system diseases are widely spread amongst the population, hygienic regulations set up for xenobiotics and biopollutants don't protect the population from the harmful influence of such pollutants. One of the ways to solve this problem is to carry out experiments as to the hygienic regulation of potential pollutants on animals with a modelled condition of immune deficiency.
Subject of the research: mice NMRI with a modelled condition of immune deficiency, and mice with a normal state of the immune system. Methods of the research: immunological, haematological, and mathematical.
Object of the research: to study the suitability of an immune deficiency model made by means of thymectomy for hygienic regulations of chemical and biological pollutants of the environment.

Goals of the research:

1. to modify the methods of performing thymectomy on mice
2. to study morphological indices of the blood in thymectomised mice in different post-operation periods
3. to study non-specific resistance indices and the state of immune system in mice in different post-operation periods.

Research framework:

While conducting this research, thirty one mice aged 30-40 days underwent thymectomy based on a modified technique. The following indices were studied on thymectomised and control animals in 6, 14, 22, 42 and 63 days following the operation:

a) hematologic indices: the number of leukocytes in 1 $mm^{1/2}$ of blood, leucoformula;
b) immunologic ones and those with non-specific resistance: phagocytic activity and phagocytic number of neutrouphiles, the level of activation of oxygen-dependent mechanism of the neutrophile bactericide activity, percentage composition of T-thymus-dependent lymphocytes in the spleen.

Diplomas

The first book of abstracts

Entertainment

Awarding

Folk programme on the closing ceremony

Excursion to Budapest

Baranavichi, Belarus, 1997

President of the LOC: ***Leonid G. Markovich***

„Chabarok" the venue

Participating countries: **7**
Belarus, Greece, Hungary, Macedonia, Russia, The Netherlands, Ukraine
Number of participants: **95**
Number of students: **60**
Number of leaders: **25**
Number of presentations: **50**

Opening ceremony

RESULTS

• Mathematics

I. prize:	**Dmitry Parilov**	Russia
	Oleg Ridchenko	Belarus
II. prize:	**Sergey Ivanov**	Belarus
III. prize:	**Tatjana Valueva**	Belarus
	Nadezda Veterets	Belarus

Jury: ***Vasily Bernik, Victor Kashkevich, George Krylov, Sergey Mazanik***,
State University of Belarus, Minsk, Belarus

• Computer Science

I. prize:	**Dmitry Suponov**	Belarus
II. prize:	**Sergey Glebov**	Belarus
	Pavel Savygin	Belarus
	Valeriy Trofimov	Ukraine
III. prize:	**Alexander Gayduc**	Belarus
	Evgeny Sharapov	Belarus
	Alexander Vrublevskiy	Belarus

Jury: ***Victor Ermolenko, Nadezsda Goncharova, Vladimir Kotov, Igor Kotov***, State University of Belarus, Minsk, Belarus

• Physics

I. prize:	**Aleksandar Donev**	Macedonia
	Kent Kune	The Netherlands
	Cees Stoop	The Netherlands
	Jeroen Wackers	The Netherlands
II. prize:	**Dmitry Geruss**	Belarus
	István Kispál	Hungary
	Anna Schmerko	Belarus
	Ferenc Szalai	Hungary
	Leonid Ukrainets	Ukraine
III. prize:	**Krisztián Buchta**	Hungary
	Jury Garkun	Belarus
	Sergey Karpovich	Belarus
	Alexander Paradinets	Belarus
	Andrey Tolochko	Belarus

Jury: ***Hans Jordens***, University of Groningen, The Netherlands, ***Lajos Skrapits***, Eötvös University, Budapest, Hungary, ***Valentin Lobishev, Michael Gavrilo,*** State University of Russia, Moscow, Russia, ***Leonid Burov, Andrey Lavrinyenko, Anatoly Slobodyanyuk, Vitaly Zhilko,*** State University of Belarus, Minsk, Belarus

Physics section


Physics section

- **Ecology**

I. prize:	**Viktória Andrasek**	Hungary
	Alexander Dardykin	Belarus
	Violetta Popko	Ukraine
II. prize:	**Alexandra Popeluk**	Belarus
III. prize:	**Yulia Vishnevskaya**	Belarus

Jury: ***Valery Tribis, Galina Semenkova,*** State University of Belarus, Minsk, Belarus, **Andrey Timoshchenko,** Saharov Environmental University, Minsk, Belarus

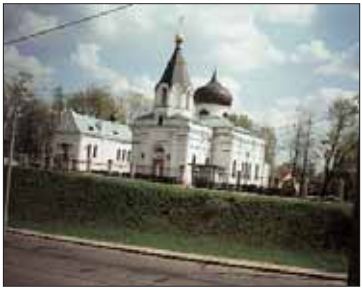

Awarding


Closing ceremony

Closing ceremony

Entertainment

Excursion to Brest



Excursion to Minsk

Visegrád, Hungrary, 1998

President of the LOC: ***Dr. Zsuzsanna Rajkovits***

Our hotels

Participated countries: **10**
Belarus, Ukraine, Russia, Georgia, The Netherlands, Romania, Macedonia, Yugoslavia, Singapore (observer), Hungary
Number of participants: **136**
Number of students: **76**
Number of leaders: **40**
Number of presentations: **65** (Mathematics: 18, Physics: 31, Computer Science: 6, Ecology: 10)

RESULTS

• Mathematics

Advanced Cathegory:

I. prize:	**Mishchenko, Sergey**	Saint-Petersburg	Russia
	Parilov, Dmitri	Saint-Petersburg	Russia
III. prize:	**Volfson, Maksim**	Saint-Petersburg	Russia

Basic Cathegory:

I. prize:	**Galibus, Tatyana**	Mogilev	Belarus
II. prize:	**Losev, Ivan**	Minsk	Belarus
III. prize:	**Mitin, Dmitry**	Kiev	Ukraine
Special prize:	**Tarasenko, Pavel** (for the solving of a Borsuk's problem)	Moscow	Russia

Jury: ***Prof. Hortobágyi István, Ruslan,*** Eötvös University, Budapest, ***Prof. George Krylov***, ***Prof. Boris Zadvorny,*** State University of Belarus, ***Andrey Yegorov,*** Journal KVANT, Moscow

Discussion of the jury in Mathematics section

• Physics

I. prize:	**Donev Alexander**	Veles	Macedonia
	Couzijn Erik P. A.		The Netherlands
II. prize:	**Bálint, Imre**	Szeged	Hungary
	Kispál István	Dunaújváros	Hungary
III. prize:	**Mironov, Dmitry**	Minsk	Belarus
	Baur Edina	Békéscsaba	Hungary
	Tolochko, Andrey	Minsk	Belarus
Special prizes:	**Kldiashvili Alexander T.** (for the construction of a simple device for measuring the Earth's magnetic field)	Moscow	Russia

	Cungovski Dimitar,		
	Ristevski Marjan and		
	Petrovski Todor	Bitola	Macedonia

(for the costruction of an apparatus suitable for the demonstration of the complex effects of air stream)

Jury: ***Prof. István Kovács, Prof. George Marx, Prof. Péter Gnädig, Prof. Péter Tasnádi,*** Eötvös University, Budapest, ***Andrei Lavrinyenko,*** State University of Belarus, ***Dr. Hans Jordens,*** University of Groningen, ***Dr. Sergey Sergeyev,*** Moscow State University, Moscow

Physics section

• Ecology

I. prize:	**Bakony Mikolt** and		
	Czegle Ibolya	Budapest	Hungary
II. prize:	**Braica Tiberiu Stefan**	Cluj-Napoca (Kolozsvár)	Romania
III. prize:	**Andrasek Viktória**	Nagykanizsa	Hungary
	Papp Gergely	Budapest	Hungary
Special prize:	**Tchankoshvili, Nickoloz**	Tbilisi	Georgia

Jury: ***Prof. Ádám Kiss, Dr. Katalin Barkács, Prof. Judit Bartholi***, Eötvös University, Budapest, ***Prof. Valentin Lobishev,*** State University of Moscow, Moscow, ***Prof. Andrey Timoshchenko,*** State University of Belarus, Minsk

Ecology section

• **Computer Science**

I. prize:	**Gaiduk Aleksander**	Baranovichi	Belarus
	Scholten Jeroen and		
	Boonstra Jan-Jeroen		The Netherlands
II. prize:	**Glebov Sergei**	Minsk	Belarus
III. prize:	**Maximets Sergiy**	Chernivtsi	Ukraine
Special prize:	**Mitrea Delia Alexandrina,**	Cluj-Napoca (Kolozsvár)	Romania

Jury: ***Prof. George Krylov,*** State University of Belarus, ***Dr. Ágnes Bérces,*** Bánki Donát Technical College, Budapest, ***Prof. Boris Zadvorny,*** State University of Belarus, Minsk

A few abstracts of the winner's presentations

Computer Science

Three-Dimensional Computer Graphic by Means of Borland Pascal 7.0

I. prize
Gaiduk Aleksander
Baranovichi, Belarus

We present a program 3D, which can be used to create three-dimensional objects based on their geometrical description. The proposed algorithm is simple enough to realize and work correctly in 99.99% situations of the overlapping and the intersection of polygons.
Our methods allays to move a viewpoint along the coordinates X, Y and Z, and change the viewing angle. The distance is also taken into consideration. For reducing shortages in the picture we use socalled "double buffer" method. For recognizing the visible points we implemented the "Z buffer" algorithm.
Program is realized on Borland Pascal 7.0 with using Assembler.

ColorSortingMachine — ELECTOR

I. prize
Boonstra Jan-Jeroen and Scholten Jeroen
The Netherlands

For the Open Experimental Physical Research in the Netherlands Jeroen Scholten and Jan-Jeroen Boonstra have designed / invented a ColorSortingMachine called the 'Elector'. Elector has been derived from the Latin word for choosing / selecting : eligere. This machine has been built on the principle of the absorption of light (different wavelengths = different colours) by coloured objects. A blue object for example absorbs red light. When you illuminate a blue object with red light, you will (in an ideal situation) detect a black object.
The sortingproces develops as follows. We put an object into the funnel and because of the funnel the object is put into the middle of the conveyer belt. The conveyer belt transports the object into the Black-Box. By means of a lightsensorsystem the conveyer belt stops as soon as the object is straight under the lightsensors. Next the object is successively illuminated by three different colours (blue, green and red). When the object absorbs one of the illuminating colours, the lightintensity will be intensely reduced. A black object will absorb all colours, a white one none. The lightsensors are connected with the

Control-Box (a signalconverter). The Control-Box is connected with a computer. By means of the software we developed, the computer draws conclusions from the measurements and gives the Control-Box instructions. The Control-Box also controls the slot, which puts the objects into the right box. The Elector can select the colours black, white, blue, green and red.

Interactive Model of Simplest Instrumental Reflexes

III. prize
Maximets, Sergiy
Lyceum N1
Chernivtsi, Ukraine

Problem of reflexes is closely connected with the problems of artificial intelligence and self-education. Reflexes are the tools that give an ability to build AI systems which consists of virtual world and objects in it. Each object has his own properties. Main object – "creature" lives in this world and the main task of creature is to survive.
At first the creature knows nothing about the world and the objects around him. The only things that it has are pre-defined reflexes of exploring and eating, etc. Then, on the basis of its previous experience it creates new reflexes which help it to survive.
Developed environment gives an ability to create new worlds, new objects, to modify the list of the predefined reflexes of the creature. It's possible to create some situations in the virtual world and observe the creature's behavior, as well as all it's parameters simultaneously. Environment has Win95-like user-friendly interface, can use MSMouse and PCKeyboard.
Program was written in Borland Pascal 7.0.

Ecology

The Noise Pollution and Some of its Questions in Cluj

II. prize
Braica, Tiberiu Stefan
Brassai Sámuel High School
Cluj-Napoca (Kolozsvár), Romania

Because of the noise pollution our living conditions can be destroyed, even our health can be ruined. To understand what noise pollution is we have to identify the origin and nature of these phenomena: sounds, noises. Sound can be simple or compound musical sound, noise and crack. The sounds' most important characteristics are the pitch, the intensity and timbre of it. We hear just those sounds that are included in the hearing area. Our ear works like a logarithmically scaled instrument. The Weber–Fechner and Stevens law shows this fact. The most important hearing theories are the resonance theory of Helmholtz and the Whirlwind theory of Bekesi.
The noise is a composition of many sounds with different pregnancy and intensity. The oscillation waves are not periodicals and the timbre of it is a long, continuous spectrum. The noises made by or because of the man are almost as old as the human civilization. Nowadays it becomes a real problem – the noise pollution. I made a statistic on people from my block-a-flats to see that the noise disturbed them or not. 1/4 cannot be disturbed by the noise, 1/2 are disturbed just by the others' noise 1/4 are disturbed even by the least noises. The most known damaging effect of the noise is the ruining of the ear. Short duration noises cause the hearing-tiredness, the long lasting noises the perception deftness. The damage is caused by high frequency and intensity sounds: noise at 85 dBA during 8 hours can be cured in 11/2 hours but noise at 100 dBA cannot be cured even in a week. The occupational diseases caused

by the loud noises are hardness of hearing, perception deftness, high blood pressure, neurosis, and other neuro-psychosis abnormalities. The allowed maximum noise level in the most of the workplaces is 90 dBA. At those places where is special neuro-psychosal and the psychosensorial stress is lower. From the complains made at the Sanitary Police Cluj my and SPC's measurement I draw the conclusion that the noise level is often lower than the allowed maximum level, but peoples still make complaints, so the noise disturb them.
The defense from noise pollution is very important to make our life more quiet, more healthy.

Special prize

Bats

Tchankoshvili Nickoloz
Tbilisi, Georgia
(Present Situation and Future)

Bats are very interesting animals, because of their interesting way of life and their great importance for the whole nature. I was greatly interested in bats' life, so I carefully studied their echo-bio development and migration processes. Because of the alarming situation of bats in different parts of Georgia, I came to the point of necessity of bats preservation. The question is: "What make bats to die?"
Pesticides
Disturbing factor
Localization of bats living area
As bats play a great role in echo-system, they need great help and defense. In my article I studied three factors given above and found the way how to save them.
There was a time when scientists worked about bats cultivation against devastation of harmful insects. So, great problem of bat-population defense came into agenda. Georgia has already joined the resolutions of Bonn Conference about bats defense.

Mathematics
Basic Cathegory

About Saharov's Problem

I. prize

Galibus Tatyana
Mogilev, Belarus

This report is devoted to solve the problem, formulated by A. D. Saharov (Kvant, 1991, N°5):
It is well-known, that for any integer m the Fibonacci sequence (in which any term is equal to the sum of the two previous terms and the first two terms are equal to 1) contains terms, which are divisible by m. It is necessary to find all such natural m, that any generalized Fibonacci sequence (in which the first two terms – are arbitrary integers) contains numbers, divisible by m.
The main result is the following: an integer m satisfies the above conditions only in four cases:
Case 1 – m is a prime number, and the first term of the Fibonacci sequence is divisible by m, has the number $m+1$.
Case 2 – the natural powers of the numbers from case 1.
Case 3 – m is equal to 2, 4 or 6.
Case 4 – the numbers of the form from case 1, multiplied by 2.
In addition, there are a few another results, connected to the main problem.

Physics

Viscosity of Flexible Chain Polymers

I. prize
Donev Aleksandar
"Gymnasium Koco Racin"
Veles, Macedonia

A two dimensional computer simulation study in which a fluid consisting of chains containing 1, 4, 8, 12, 16 and 20 rigid disks connected with flexible bonds was simulated on a regular PC. These chains should represent the long macromolecules in pure polymers like polystyrene (PS) or polyethyleneoxide (PEO). The main purpose of the paper is to find the coefficients of diffusion and the shear viscosity. The main conclusion is that the kinetic transport coefficients decrease with increasing chain length, probably they are inversely proportional to the square root of the length. This means that in polymer solutions the intrinsic viscosity should be proportional to the square root of the molecular mass. However, it has to be noted that a more precise three dimensional study on a faster computer and with longer chains is needed in order to make more precise conclusions.
An experimental construction of a rotational viscosi-meter we intended to use for studying PEO water solutions. After trying concentric spheres and coaxial cylinders as rotational bodies, it was concluded that the experimental data do not match the theory predictions, probably due to constructional problems, especially the non-coaxiality of the rotational bodies. Therefore it was decided to use measurements on the rotating electromotor and to calibrate the apparatus empirically. Measurements are still going on and some improvements of the rotational bodies are being made and the results will be presented at the competition.

Awarding

Folk programme of school pupils

Entertainment

Palace of Mathias Rex

Visegrád on the Bank of Danube

National Museum, Budapest

The Parlament House, Budapest

The Heroes Square in Budapest

Baranavichi, Belarus, 1999*

President of the LOC: ***Leonid G. Markovich***

Participants of the Conference

Participating countries: **5**
Belarus, Hungary, Russia, The Netherlands, Ukraine
Number of participants: **85**
Number of students: **50**
Number of leaders: **20**
Number of presentations: **42** (Mathematics: 9, Computer Science: 5, Physics: 18, Ecology: 10)

RESULTS

• Mathematics

I. prize:	**Yuriy Staroselsky**	Belarus
	Dmitri Parilov	Russia
	Dmitri Kamenetski	Russia
II. prize:	**Tatiana Galibus**	Belarus
	Michael Pliskin	Russia
III. prize:	**Vasily Tikhonenko**	Belarus
	Eugeny Yakovets	Belarus

Jury: ***Vasily Bernik, Victor Kashkevich, George Krylov, Boris Zadvorny, Sergey Mazanik***, State University of Belarus, Minsk, Belarus

• Computer Science

I. prize:	**Stephan Bosch**	The Netherlands
	Michiel Hendriks	The Netherlands
	Rob Leemkuil	The Netherlands
II. prize:	**Alexander Suvorov**	Belarus

* The planed venue of the conference was Ohrid, Macedonia, but the venue one month before the date of ICYS was changed because of the bombing of Serbia-Montenegro by USA.

Jury: ***Victor Ermolenko, Nadezsda Goncharova, Vladimir Kotov, Igor Kotov***, State University of Belarus, Minsk, Belarus

• Physics

I. prize:	**Krisztián Buchta**	Hungary
II. prize:	**Igor Timoshchenko**	Belarus
	Andor Merksz	Hungary
	Andriy Viklyuk	Ukraine
III. prize:	**Maria Nudnova**	Belarus
	Katherin Korolenko	Belarus
	Andrey Ilyutenko	Belarus
	Alexander Pletnev	Belarus
	Nataliya Leonovich	Belarus
	Sergey Dmitrenko	Ukraine

Jury: ***Hans Jordens***, University of Groningen, The Netherlands, ***Lajos Skrapits***, Eötvös University, Budapest, Hungary, ***Valentin Lobishev*** State University of Russia, Moscow, Russia, ***Leonid Burov, Andrey Lavrinyenko, Anatoly Slobodyanyuk, Vitaly Zhilko,*** State University of Belarus, Minsk, Belarus

Presentations

The jury in Physics section

• Ecology

I. prize:	**Eugeniy Lobanov**	Belarus
	Mikalai Malinovski	Belarus
	Oleksandra Popelyuk	Ukraine
	Julia Miron	Belarus
II. prize:	**Krisztián Buchta**	Hungary
III. prize:	**Tatiana Ishchenko**	Ukraine

Jury: ***Valery Tribis, Galina Semenkova,*** State University of Belarus, Minsk, Belarus, **Andrey Timoshchenko,** Saharov Environmental University, Minsk, Belarus

Krisztián Buchta winner in two sections

The winners

Awarding and the closing ceremony

War memorial in Minsk

Excursion to a Monastery

Minsk

Entertainment

Minsk

Romain Catholic Cathedral

Nijmegen, The Netherlands, 2000

President of the LOC: ***Sjef van Groningen***

Participating countries: **10**
Belarus, Greece, Hungary, Poland, Romania, Russia, Slovakia, The Netherlands, Ukraine, Yugoslavia
Number of participants: **110**
Number of students: **64**
Number of leaders: **31**
Number of presentations: **62**

RESULTS

• Mathematics

I. prize:	**Vassil Khalidov**	Russia
	Kinga Jeczminska	Poland
II. prize:	**Vladimir Lazić**	Yugoslavia
	Alexander Nechiporuk	Russia

Jury: ***Prof. dr. A. C. M. van Rooij***, ***Dr. J. D. M. Maassen***, ***Dr. B. J. W. Polman***, ***Dr. W. H. M. Veldman***, ***Dr. R. Kortram***, The Netherlands

• Computer Science

I. prize:	**Dmytro Yerhov**	Ukraine
II. prize:	**Alexey Kovalev**	Russia
	Pavel Kalashnikou	Belarus
	Levente Bodor	Hungary

Jury: ***Mr. Ir T. van de Weerd***, ***Prof dr. J. A. M. Leunissen***, Nijmegen, The Netherlands, ***Drs. G. Boeijen***, Arnhem, The Netherlands

Presentation

Awarding

• Ecology

I. prize:	**Mikalai Malinouski**	Belarus
	Lieuwe Piers	The Netherlands
II. prize:	**Slawomir Kuczkowski**	Poland
	Timea Balassa	Hungary

Jury: ***Dr. M. Martens, Dr. A. J. P. Smolders***, Nijmegen, the Netherlands, ***Prof. Dr. V. I. Lobishev***, Russia, ***Prof. Dr. A. Timoshchenko***, Minsk, Belarus

Presentation in Ecology section

Awarding

• Physics

I. prize:	**Alexey Dobrynin**	Russia
	Balant Szentre	Romania
II. prize:	**Norbert Kiss**	Hungary
	Merijn Reijnders & Pim Altena	The Netherlands
	Yevgeniy Kryukov	Ukraine
	Fülöp Loránd Árpád	Romania

Jury: ***Drs. H. Jordens,*** Groningen, The Netherlands, ***Dr. J. W. Hendriks***, ***Dr. P.C. M. Christianen***, Nijmegen, The Netherlands, ***Prof A. Lavrinenko***, Belarus, ***Ass. Prof. L. Skrapits,*** Budapest, Hungary

Experimental part of the presentation

One of the most interesting presentations

Antibubbles

Students: **George and Robert Jan Sips**
School: Gymnasium Beekvliet (high school), Sint Michielsgestel.
Teacher: W. Ottenvanger
First prize: Van Melsen Prize Radboud University Nijmegen

Introduction
Soap bubbles floating in the air are very well known, as a child everybody likes to blow them. A soap bubble is a thin layer or film of soap surrounding air. We investigated the opposite of this bubble; the antibubble. An antibubble is a thin layer of air surrounding fluid, floating in another fluid (see figure 1).

Hypotheses
We think it is possible make antibubbles and measure their thickness and velocity.

Theory
An antibubble is a pocket of liquid enclosed within a layer of gas, the whole thing surrounded by another liquid. Somehow a thin layer of air becomes trapped around a drop of liquid when it falls on the

surface of another liquid. Often a “boule”, or a floating drop, forms on the surface. An antibubble forms when the drop becomes totally submerged (see figure 2). If the drop contains a denser solution, the antibubble which is formed will actually sink to the bottom of the vessel.

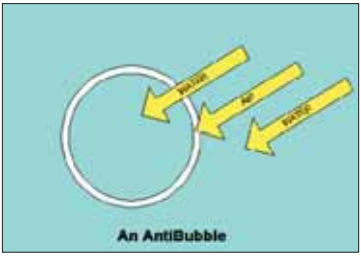


Figure 1: an antibubble

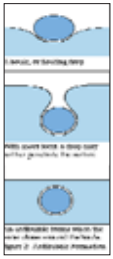
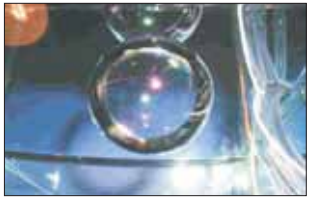
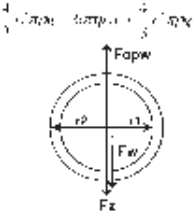


Figure 2: forming of an antibubble

The bubbles will rise in the fluid with constant velocity, if:



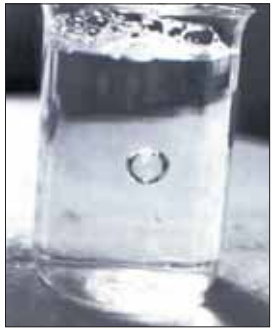


Materials and Methods

Drops were dropped from a pipette into a container; the pipette and the container held different fluids. The antibubbles were formed it was essential, straight onto the surface, antibubbles were formed at spots were there where many surface bubbles and the final drop must be stronger than the former. Antibubbles were best formed at a spot where bubbles were clustered. We tested different combinations of fluids in the pipette and the container. Then we determined the diameter of the bubbles by scanning photos with Adobe Photoshop. The thickness of the layer of air was calculated two ways, by subtracting the inner bubble from the outer bubble and by using the formulae

$$(\rho\ 4/3\ \pi\ r_2^3\ g = 6\ \pi\eta\ r_2\ v + \rho\ 4/3\ \pi\ r_1^3\ g).$$

Also the velocity of the antibubbles was measured and calculated with the formulae (Fopw = Fz + Fw).



Experimental results

Fluid in the pipette	Fluid in the container			
	olive oil	olive oil + Dreft*	demineralised water	demineralised water + Dreft
olive oil	no bubbles	no bubbles	oil layer on the water surface	oil layer on the water surface
olive oil + Dreft*	no bubbles	no bubbles	oil layer on the water surface	oil layer on the water surface
demineralised water	water layer sink through oil	water sinks through oil	no bubbles	anti bubbles
demineralised water + Dreft	water bubbles sink through oil	water bubbles sink through oil	anti bubbles	anti bubbles
	HCl (2M) + Dreft	demineralised water + Dreft	NaOH (2M) + Dreft	demineralised water + Dreft
HCl (2M) + Dreft	anti bubbles	anti bubbles, sink quickly		
demineralised water	Dreft	anti bubbles, rise	anti bubbles	
+ NaOH (2M)			anti bubbles	anti bubbles,
+ Dreft				sink quickly
demineralised water + Dreft			anti bubbles, rise	anti bubbles

Dreft; brand of dishwashing detergent.

	Radius (cm)				Velocity	
	whole bubble	inner bubble	air layer I*	air layer II*	measured ($x\,10^{-3}$)	calcu-lated
1	0.17	0.11	0.055	0.0001	2.6	4.17
2	0.51	0.38	0.13	0.001	21	34.1
3	0.40	0.28	0.12	0.0008	15	22.9
4	0.23	0.18	0.05	0.0005	4.1	6.44
5	0.28	0.20	0.08	0.0004	7.1	11.0
6	0.29	0.22	0.07	0.00045	6.2	10.8
7	0.38	0.28	0.10	0.00046	12	19.5
8	0.31	0.23	0.08	0.0005	8.3	12.37
9	0.25	0.18	0.07	0.0006	5.2	8.42
10	0.40	0.28	0.12	0.0008	8.1	12.8
11	0.31	0.21	0.10	0.0004	9.3	14.9
12	0.16	0.11	0.05	0.0001	2.7	3.76
13	0.33	0.25	0.08	0.0005	8.1	13.4
14	0.33	0.25	0.08	–	–	12.5
15	0.20	0.15	0.05	0.00055	3.3	5.7
16	0.40	0.32	0.08	0.0007	7.8	18.9
17	0.40	0.31	0.09	0.006	3.9	19.4
18	0.45	0.34	0.11	0.008	15	25.1
19	0.38	0.28	0.10	0.002	11	17.9

* I: through subtraction, II calculated with formulae using velocity of the bubble.

Conclusion

We were able to produce antibubbles when we used specific combination of fluids in the pipette and container. Anti bubbles are only formed into polar fluids and detergent is necessary. We also could determine velocity and thickness of the bubbles although not accurately according to the theory.

On the closing ceremony

Belarus

Russia and Romania

The Netherlands

Greece

Invitation to the 2001 ICYS to Poland

Entertainment

Katowice, Poland, 2001

President of the LOC: ***Urszula Woźnikowska-Bezak***

Participating countries: **12**
Belarus, Czech Republic, Hungary, India, The Netherlands, Romania, Russia, Slovakia, Ukraine, USA, Yugoslavia, Poland. Finland (observer), Germany (observer).
Number of participants: **110**
Number of students: **65**
Number of teachers **23**
Number of presentations: **62** (Mathematics 10, Physics: 21, Computer science: 13, Ecology: 18)

Opening Ceremony

RESULTS

• Mathematics

I. prize:	**Mikhail Berlin**	Saint-Petersburg	Russia
II. prize:	**Evgen Mirotin**	Minsk	Belarus
	Denis Nazarov	Ufa	Russia
III. prize:	**Maxim Martynov**	Saint-Petersburg	Russia
	Marcin Michalak	Katowice	Poland

Jury: ***Mieczysław Kula,*** Poland, ***Ilia Chistiakov,*** Russia, ***Waldemar Holubowski,*** Poland, ***Shamil I. Tsyganov,*** Russia

• Physics

I. prize:	**Oleksiy Lavrentyev**	Chernivtsi	Ukraine
	Sándor Borbély	Tirgu Mures (Marosvásárhely)	Romania
	Katerina Petrovic	Belgrade	Yugoslavia
II. prize:	**István Ballók**	Gödöllő	Hungary
	Ann Harbachova	Minsk	Belarus
III. prize:	**Árpad Drozdy**	Budapest	Hungary
	Nemanja Spasojević	Belgrade	Yugoslavia

Jury: ***Leonid Markovich,*** State University of Belarus, Minsk, Belarus, ***Hans Jordens,*** University of Groningen, The Netherlands, ***Zsuzsanna Rajkovits*** Eötvös University, Budapest, Hungary, ***Maciej Kolwas,*** Polish Physical Society, Warsaw, Poland, ***Wladyslaw Borgiel,*** Poland, ***Maciej Maska,*** Poland

Work in the Physics section

• Computer science

I. prize:	**Gleb Bordovskij**	Minsk	Belarus
II. prize:	**Ivan Scherbakov**	Kharkiv	Ukraine
III. prize:	**Krisztián Buza**	Dunaújváros	Hungary

Jury: ***Roman Bukowski***, Poland, ***Adam Pucia,*** Poland, ***Ismet S. Isik***, USA, ***Dhirendra K. Singh***, Lacknow, India

• Ecology

I. prize:	**Marleen Schutterá**		
	Linda Rijnen		
	Lotte van Dijk		
	Justine Moonen	Nijmegen	The Netherlands
	Vera Veltkamp and		
	Marcella Maathuis	Groningen	The Netherlands
II. prize:	**Wilco Klutman**	Nijmegen	The Netherlands
	Barbara Rynska	Katowice	Poland
III. prize:	**Beatrix Pollák**	Baja	Hungary

Jury: ***Andrzej Zastawny***, Poland, ***Jan Marijnissen,*** Radbow University, Nijmegen, The Netherlands, ***Tamara Grankina***, Kharkiv, Ukraine, ***Piotr Skubala,*** Poland, ***Izabella Franiel,*** Poland

The winner Dutch team with 4 lecturers and the jury

Some abstracts of the most interesting presentations

Tesla Coil – great device to grasp a world of electricity

Jakub Wyrobek
Creative Group Quark
Katowice, Poland

Main purpose of making this presentation was to show people how helpful can be unbelievably simple device such as Tesla coil. It helps to understand for example RLC circuits. If you built Tesla coil then you already know a difference between a theoretical model and reality. Through it, a lot of physics law can be acquainted and checked. I think it's the most important advantage. There is also one another virtue, it teaches by amusing.

First of all there is a theoretical part where I introduce to characteristic of this device and show theoretical model of Tesla coil. There are also a few graphs which present a change of current and voltage in primary and secondary coils in dependence of time.
Secondly there is an experimental part where I measure properties of electromagnetic field. I designate a frequency on which Tesla coil works. My measurements show a nature of magnetic and electric component of electromagnetic waves.
Thirdly there is part of comparison where I check if theoretical model is compatible with measurements. Here is also an explanation about measurements' errors.
In the end I will try to make show, which helps to explain and affirms the true nature of Tesla coil's current.

III. prize in Physics

Coloured sand

Árpád Drozdy,
ELTE Radnóti Miklós Grammar School,
Budapest, Hungary

Every granular material has two properties that determine how it will react:

Shape
Every granular material has an angle of repose. This is the steepest slope of a pile of that material. It also represents its tendency to roll:
Large angle of repose ⇨ rough, faceted grains.
Small angle of repose ⇨ smooth, round grains.

Size
Larger grains roll easily over small grains.
Small grains get easily caught between large grains ⇨ small grains will form a thin, smooth film over stationary grains.
When lots of grains flow together, small grains will be found lower, and large grains will be found higher. The smaller, lower grains will also flow slower.
When pouring grains into a pile, segregation will occur. Larger, smoother grains roll faster, and will be found lower.
Smaller, rougher grains roll slower, and get caught often already at the top of pile, and will be found higher. When the larger grains are rougher than the small grains, stratification may occur.
The explanation lies in a series of **avalanches**, and a 'kink' mechanism.
The grains always stop at a kink that moves upwards. Grains with different properties will stop at different parts of the kink. This phenomenon will start when by accident in one place larger, rough grains stop. Here grains get caught, forming the first kink.
Wider container ⇨ thinner pairs of stripes.
Stripe width is irrelevant of the rate of pouring, if under a critical rate.
The phenomenon occurs with only a couple of pairs of granular materials, but sand and semolina are best.

I. prize in Physics

Rainbow on the table

Sándor Borbély
Bolyai Farkas Theoretical High School
Marosvásárhely, Romania

The well known phenomenon in Nature is very attractive, the description of the formation of a series of rainbow is a solved problem, but for the solution is not enough the knowledge from the school physics. Artificial rainbow, an original experiment, – as a model of real rainbow – was shown by application of polystirene, zeolite and glass balls, and the observed particularities were quantitatively analyzed and theoretical description was made in the presentation. The rainbow curves made by PC were also shown.

II. prize in Physics

Catastrophe in Optics

Ann Harbachova
Lycee of BSU, Minsk, Belarus

In spite of the fact, that the caustics is a known phenomenon from the ages, a new type of approach was given in the description. Caustics forming in an elliptical cup and on the cylindrical surfaces of a CD, were shown with the explanation and computer simulation of the phenomenon.

The importance of the International Conference of Young Scientists in Poland

We live in the world in which development of the science was used to create new technologies for human needs. It became possible thanks to cooperation between experts with different fields like physics, chemistry, mathematics, computer science or environmental sciences. Those fields are also used in ecology, which existence and development are extremely important for proper human influence on natural environment especially nowadays when this influence called anthropo pressure is growing up with development of new industrial and communication technologies.
Cognition of nature was connected with necessity of its subjugation and subordination to human being. It was the first step of development. Tools production was an impulse to significant discoveries in mechanic. In astronomy and mathematics determining of time intervals was the impulse, in energy it was the discovery of fire, in chemistry processing of materials and in biology it was cultivation. It wasn't cognition in the present meaning of scientific discoveries because there were no records or quantitative description. With the passage of time, when cultures and civilizations were shaped, when human had much more free time and became more inquiring and intellectually demanding, he started to describe nature quantitatively. It also became important regarding the possibility to transfer information and share knowledge alongside social groups.
Millenniums passed before abstract mathematics became necessary instrument in physics research and in formulation of physics laws. Description of the surrounding reality by means of numbers is indispensable when we formulate it basing on measurements of characteristic variables for objects and phe-

nomena which we analyze. In case of experiments connected with surrounding nature and our natural or transformed environment, numbers which are result of measurements are only some indicators. That is due to the lack of physical theories which can describe huge variety of the world of animate and dead matter, relations and interaction between atmosphere, hydrosphere, lithosphere and biosphere – main elements of our natural environment. Those number indicators apart from exactly known physical constants are very important in attempt of model description of phenomena happening on the Earth, of circulation of matter and energy, their reconstruction or prediction. They allow determine human influence on the development of environment and point to advantages and disadvantages of this influence. Mathematics and computer science are of great importance in modeling and prediction.

Without ecological look on the world balanced evolution and development of our civilization is impossible. Multidisciplinary science work including cooperation between physicists, mathematicians, computer scientists and ecologists is very important in this case. It can be initiated by very young people who are aware of this work importance. Because of the global character of human influence on the environment through modern industrial and communicate technology, this scientific cooperation, also between young people, should be of international character. It would be possible if we create opportunities for international meetings like International Conference of Young Scientists in the fields of mathematics, physics, computer science and ecology.

Urszula Woźnikowska-Bezak
Head of the Department of Science
Youth Palace, Katowice

Closing ceremony with reception


Disco and Big "ICYS" cake for all guests


Excursion to "Wieliczka" Salt Mine


Excursion to Cracow

Kutaisi, Georgia, 2002

President of the LOC: ***George Laskishvili***

Kutaisi

Participating countries: **9**
Finland, Belarus, Czech Republic, Hungary, Germany, Romania, The Netherlands, Poland, Georgia
Number of participants: **98**
Number of students: **56**
Number of leaders: **21**
Number of presentations: **49**

RESULTS

• Mathematics

I. prize:	**Irakli Chorgolashvili**	Tbilisi	Georgia
II. prize:	**Konstantin Karosanidze**	Tbilisi	Georgia
III. prize:	**Roger Rikken, Roel van Hout** and		
	Michiel Haanappel		The Netherlands
	Mary Gorelashvili	Tbilisi	Georgia

Mathematics section

Jury: ***George Oniani***, Tbilisi, Georgia, ***Mamuka Meskhishvili***, Tbilisi, Georgia, ***Rolf Bayer,*** Stuttgart, Germany, ***Marika Hagros***, Espoo, Finland

• Ecology

I. prize:	**Jochen Butzer**,	Stuttgart	Germany
	Fardo Weitsenburg and		
	Hessel Nujenhuis		The Netherlands
	Nina Vollbehr		The Netherlands
II. prize:	**Krisztina Nikowits**	Budapest	Hungary
	Dzmitry Kazmachou	Minsk	Belarus
Special Prize:	**Kamila Kalachova**	Prague	Czech Republic

Jury: ***Andrey Timoshchenko***, Minsk, Belarus, ***Nick Chankoshvili,*** Tbilisi, Georgia, ***Temur Adeishvili,*** Tbilisi, Georgia, ***Jan Marijnissen,*** Nijmegen, The Netherlands

• Physics

I. prize:	**Jochen Ott**	Stuttgart	Germany
II. prize:	**Dominik Schmid-Lorch**	Stuttgart	Germany
	Beka Khvedelidze	Tbilisi	Georgia
III. prize:	**Árpád Drozdy**	Budapest	Hungary
	Eldad Roobol and		
	Bard de Vries,		The Netherlands
	Ondrej Certik	Prague,	Czech Republic
Special prize:	**Tornike Tvalavadze**	Tbilisi	Georgia

Jury: ***Aleksander Gongadze***, Tbilisi, Georgia, ***Lajos Skrapits***, Budapest, Hungary ***Frans van Liempt***, Amsterdam, The Netherlands ***Carsten Hundegger***, Stuttgart, Germany ***Petr Pudivitr***, Prague, Czech Republic

Physic section

• Computer Science

I. prize:	**Gleb Bordovsky**	Minsk	Belarus
	Markus Trautwein	Stuttgart	Germany
II. prize:	**Sandro Tarkhnishvili**	Tbilisi	Georgia
	Joep de Groot		The Netherlands
III. prize:	**Nana Gobadze** and		
	Nino Makatsaria	Tbilisi	Georgia
	Leena Hallivuori	Espoo	Finland
Special prize:	**Soso Bliadze**	Tbilisi	Georgia

Computer Science section

Jury: ***Rolf Bayer***, Stuttgart, Germany, ***Akaki Dzneladze***, Tbilisi, Georgia, ***Beso Shioshvili***, Tbilisi, Georgia, ***Péter Kenesei***, Budapest, Hungary

Abstracts of the winner presentations

I. prize in Computer Science

Autonomous truck arrange system

Markus Trautwein
Germany

We are working in our workshop at the "Pupil Research Center" in Bad Saulgau (Germany) on a tractor-trailer project. We modified a model truck and equipped it with different sensors and a micro-controller. This micro-controller is able to control and navigate the truck.
The software we developed which scans the surrounding environment and searches for a ramp or wall to dock. It uses route-planning and real-time multi-threading to find and avoid blockades and find the most efficient way to the ramp or wall.
With this project we are able to develop and test algorithms which can be easily transferred to real-size trucks.

II. prize in Ecology

Biological Viruses – Software Viruses

Krisztina Nikowitz
Fazekas Mihály Grammar School
Budapest, Hungary

Viruses constitute one of the most intriguing groups of "living things" in biology. Their origin as well as almost all of their properties is subject to extensive debates – as indeed is their taxonomical classification.
The word "virus" is a collective name. It is used for the definition of notions in biology, computer science, linguistics and a number of other areas. What is the common element in these things which appear to be so different? This is the question our paper addresses.
Examination of biological viruses reveals multiple analogies with computer viruses. The most conspicuous similarity is their inability to proliferate without a host organism. This trait makes them difficult to classify in terms of the well-established and generally accepted categories living or non-living in biology; program or data in information technology).
We are virtually defenceless against most biological viruses mainly due to their tremendous ability to mutate. In information technology known viruses can be relatively efficiently screened and the risk of "infection" can be reduced almost to zero with different security measures. Is it possible that methods proven effective in one area could be applied successfully in the other?
The authors used the tobacco plant to study the mechanism of biological viral infection. The most effective protection so far seems to be the production of genetically modified plants. This, however, only offers protection from a specific type of virus. In-depth study of the "immune response" of plants may bring us closer to the full elimination of viral problems.
Our paper is aimed at bringing viruses closer to man through restructuring and comparing the huge mass of data available so that we can find the loopholes inevitably present in biology by observing the activity of computer viruses.

The importance of ICYS for the Georgian students

One member of Georgian team, Nikoloz Chankoshvili, was successful in Visegrád, Hungary, in 1996. For the work about rats he was awarded by special prize. For that Nika is called "Batman". Nowadays Nika is successful biologist, works at the Medical State University, he participated in the processes of plural judges in the conference held in Kutaisi, Georgia in 1998, which was the base for the Georgian pupils for further participations in important contests. In Georgia, as well as in many other countries all over the world the level of interest towards the Natural Sciences is decreasing and exactly for that reason the role of the international youth scientists' conferences becomes continuously important.
As it was find out the interest correctly directed even during the school years often becomes the determining for the mankind future. This was proved by the vast majority of the participants.
Most of the participants of the final stage were from the best schools of Georgia, from the Georgian-American high school and the I. Vekua public school. Preparations for the "Project works" are the main part of the school's annual plan. The instructor of the Georgian-American school team is doctor of sciences in Physics and Mathematics, Mamuka Meskhishvili. His students are systematically succeeded in the mathematics section. They won in the conferences held in The Netherlands (2004), Poland (2005), Germany (2006) and Ukraine (2008) too, in Poland even in the section of computer science. The success is always determined the pupils' further professional development. Let us listen to them: Koki Glonti (Mathematics, first place, Holland 2004) "For the Georgian TV Show I used the modification version of the presentation techniques which I previously used for the conferences. Here the

Success Has played important role for my career. Nowadays I am enrolled in the University of Prague.
Lela Latsoshvili: (Mathematics, first place, Poland, 2005)
"After graduating from school I had the following choices: Either follow the doctoral career or enter the Medical faculty. After the success in Poland I had not difficulties in making the choice. Now I am graduating from Tbilisi State University and preparing for thesis maintaining."
Also Levan Lapachi (first place, Informatics, Poland, 2005)
George Kukhalashvili (first place, Mathematics, Poland, 2005) Lado Meskhishvili (first place, Mathematics, Ukraine, 2008) Levan Grdzelishvili (first place, Mathematics, Ukraine, 2008) Nino Gigashvili (second place, Mathematics, Germany, 2006) has chosen the ways to the Science learning.
Increasing the number of participants means the further popularity of the ICYS. Six participants in a team in 1994, more then twenty-two in the team is already registered for 2009 and what is also very important the Geography of the conference is also increased.
The atmosphere in the conference should also be mentioned, that of course is the merit of the organizers. All the host countries try to make their program more diverse and various, which of course support the better acknowledgement of the host country. I hope the conference will also be successful within the following years.

Gia Laskishvili

Entertainment


Excursion to the Gelati Monastery


Concert for the participants

Prague/Kladno, Czech Republic, 2003

President of the LOC: ***Assoc. Prof. Dr. Zdenek Kluiber PhD.***

Prague

Kladno

Participating countries: **14**
Belarus, Czech Republic, Finland, India, Cyprus, Lithuania, Hungary, Macedonia, Germany, The Netherlands, Poland, Romania, Russia, Ukraine
Number of participants: **129**
Number of students: **77**
Number of leaders: **22**
Number of presentations: **71** (Physics: 20, Mathematics: 13, Ecology: 24, Computer Science: 11, Application of Doppler´s Phenomenon 33)

Opening Ceremony

Conference photo

RESULTS

• Mathematics

I. prize:	**Pavel Soloviev**	Russia
	Evgeny Loharu, Sergey Ivanov	Russia
II. prize:	**Eugeny Amosov**	Russia
	Alexander Ivanov	Russia
III. prize:	**Sergey Chernov**	Belarus
	Artem Kovalchuk and	
	Michail Nurulin	Russia

Jury: ***Assoc. Prof. RNDr. M. Krbec, PhD.*** Czech Republic

• Computer Science

I. prize:	**J. Kahn**	Germany
II. prize:	**Sergey Serdyukov**	Russia
III. prize:	**Jakob Marquardt**	Germany

Jury: ***Ing. F. Matus, PhD.***

• Physics

I. prize:	**Adriaan Kleinhout** and	
	Ward Stolk	The Netherlands
	Ágnes Emőke Horváth	Romania
II. prize:	**Lutzen Kuiper**	The Netherlands
	Máté Bocz	Hungary
III. prize:	**Andre Krause**	Germany
	Alicja Wierzcholska	Poland

Physics section

Jury: ***RNDr. Z. Janu, PhD.*** Czech Republic, ***Vitaly Zhilko***, Belarus, ***Sergey, Sergeev***, Russia, ***Carsten Hundegger***, Germany, ***Frans Van Liempst,*** The Netherlands

• Ecology

I. prize:	**Jochen Butzen**	Germany
	Remco Van der Gaag and	
	Vic Van Dijk	The Netherlads
II. prize:	**Polina Negriu**	Ukraine
	Ganna Boyko	Ukraine
III. prize:	**Natalia Buko**	Lithuania
	Fiona Reinaerts and	
	Dagmar Van Wersch	The Netherland

Jury: ***RNDr. J. Neustupa, PhD.***

Ecology section

• Application of Doppler´s Phenomenon

I. prize:	**Sebastian John De Vet**	The Netherlands
II. prize:	**Ádám Simontsits**	Hungary
III. prize:	**Aneta Sajdova**	Czech Republic

Doppler section

Jury: ***MUDr. B. Kristková,*** Czech Čepublic, ***Lajos Skrapits***, Hungary, ***Paul Pshenichka***, Ukraine

Awarding

Abstracts of some of the most interesting presentations

Magtrans research for an Inductrack based Maglev

Adriaan Kleinhout and Ward Stolk
The Netherlands

Maglevs are magnetically levitated trains. Several systems exist for lifting and propelling the train. The concept of coil-gun propulsion, used in missile techniques, and Inductrack, lifting by induction, are not yet used for Maglevs. Experiments have been done to show that the combination of these two concepts is possible for maglevs. This should save a lot of the operating costs. The result of this research is a design of a maglev, called the Magtrans. Certain parameters for a model of this maglev have been experimentally determined and others have been calculated. The model will hover on the Inductrack concept. Hovering is possible with any speed higher than the transition speed, which is about 1.3 ms^{-1}. The maglev's propulsion system is based on the coil-gun concept. This means the train rides through propulsion coils. The propulsion coils can give the train enough speed to go faster than the transition speed.

Turn towards the external magnetic field!
(experiments with ferromagnetic substances)

Horváth Emőke Ágnes
Bolyai Farkas Secondary School,
Tirgu Mures, Romania

Starting from the Barkhausen and the Procopiu effects, I proposed myself to examine the magnetic properties of ferromagnetic substances and to explore the nature of magnetism and magnetic fields.
I repeated the experiments conducted by the above mentioned two physicists, I did a few minor changes and added my own results as well.
In 1919, Barkhausen proved experimentally that the atoms in a ferromagnetic substance are grouped in microscopic regions called *domains*. In

each domain the atoms have magnetic moments aligned strictly in a single direction, that of easy magnetization. When a ferromagnetic material is placed in an external magnetic field, two effects occur. The domains more favourably oriented in this magnetic field increase in size at the expanse of less favourably oriented adjacent domains. Other domains rotate in order to become more favourably oriented according to the external field. This is how I explain *the Barkhausen phenomenon:* approaching and distancing a permanent magnet to the ferromagnetic piece of metal placed in a solenoid, which is connected serially to an amplifier, a distinct sound could be heard. To indicate the effect I connected a multi-turn coil to the microphone amplifier of a cassette recorder. I used several substances (Fe, Co, Ni, permalloy) and according to their different magnetic behaviour, I grouped them in two: *soft magnetic materials* (with low coercitivity – they demagnetize when I remove the magnet) and *hard magnetic materials* (with high coercitivity – in order to demagnetize them a reverse magnetic field is needed). Using my own method, I drew the hysteresis curve in case of both types: I placed the multi-turn coil into a larger one, which I connected serially to a tension source and an ammeter. Changing the tension continuously, I noticed and wrote down the current intensity intervals, when I heard the sound. Knowing the current intensity, I evaluated the magnetic field-strength and then represented the magnetization in function of it. Comparing the loops, the two types are easy to separate because of their shape, area and the values of M_r *(remanent magnetization)* and H_c *(coercive force).* By a simple procedure.
I managed to calculate both the H_c and the interval of the magnetic reversal field-strength.
Placing a soft magnetic material into the solenoid, and then bending, torsion and dragging it, I could hear the distinctive sound even in the absence of an external magnetic field. I concluded that if I subdue the ferromagnetic substance to a mechanical stress, the domains change direction inducing voltage impulses while I remain in the limits of elasticity.
The Procopiu effect has similar physical bases. Barkhausen noticed, that the iron wire can be concentrically magnetized by its own current, and the sound can still be hear. Procopiu used this identification to detect and measure very weak magnetic fields. The basic experiment: I extend a thin iron wire along the axe of a solenoid, which I connect to an oscilloscope. I conduct alternative current through the wire, which magnetises the substance concentrically. Because of its nature the domains are obliged to change directions in each half period. This can happen in all possible courses. But if I "order" them to rotate into a specified direction – which I can do by using a weak external magnetic field – I generate a flux change in the direction of the coils axe, so I can see the shape of the newly obtained emf on the oscilloscope.

My observations:

- the shape of the voltage showed by the oscilloscope changes according to the distance of the magnet from the iron wire and the polarity the magnetic field has;
- comparatively with the 50 Hz sinus curve, the frequency o the Procopiu voltage has doubled his value (100 Hz);
- due to *the terrestrial magnetic field* I could influence the shape of the curve. I measured the magnetic flux density of Earth using the so called method: measurement by compensation. My result – $2{,}22*10^{-5}$ T – is similar to the value I found in the reference sources;
- my work was continuously disturbed by a weird sign on the oscilloscope. The magnetic field of the electric equipments in the laboratory influenced the shape and value of the Procopiu tension. From here I got the idea that the Procopiu effect can be produced with the help of alternative external magnetic field.

All in all I sum up the results of the two phenomena using the glass metal: a very soft magnetic substance, which reaches saturation quickly and its domains change direction at the influence of a relatively weak field (its magnetic permeability being big).

The importance the ICYS for the country

Under the support of the Ministry of Education there was realized a research questionnaire survey between students and members of their accompaniment. Results of this analysis will be applied in further work with students in the Czech Republic and then they will be presented abroad.

Zdenek Kluiber

Entertainment

Folk music in Kladno

Excursion to the Karlstejn Castle

Physics on the Bridge

Prague

Prague

Nijmegen, The Netherlands, 2004

President of the LOC: ***Dr. Jan Marijnissen***

Nijmegen

Participating countries: **11**
Belarus, Germany, Georgia, Hungary, Ukraine, Poland, Russia, Lithuania, Macedonia, The Netherlands, Croatia (observer)
Number of participants: **134**
Number of students: **92**
Number of leaders: **37**
Number of presentations: **58**

Quiz at the Radboud University

RESULTS

• Physics

I. prize:	**Andreas Stippig**	Germany
	Daniel Gruen	Germany
II. prize:	**Grigory Dmirtienko**	Russia
	Felix Nissen	Germany

III. prize:	**Dániel Varjas**	Hungary
	Bart Nederstigt and	
	Paul van der Zwet	The Netherlands
Special prize:	**Alicja Wierzcholska**	Poland
	Mihály Békey	Hungary

Jury: ***Prof. Dr. S. J. de Jong,*** The Netherlands, ***Dr. Th. J. M. Smits***, The Netherlands, ***Dr. A. C. Konig***, The Netherlands, ***Lajos Skrapits***, Hungary, ***Carsten Hundegger***, Germany, ***Prof. Valentin Lobyshev***, Russia

Computer Science section

Ecology

• Computer Science

I. prize:	**Peter Vingelmann**	Hungary
	Nana Lemonjava	Georgia
II. prize:	**Denis Khromov**	Russia
	Ivan Scherbakov	Ukraine
III. prize:	**Rein Spijkerman,**	
	Gijs van Swaaij	The Netherlands
	Stefanie Schmid	Germany

Jury: ***Prof. Dr. F. W. Vaandrager***, The Netherlands, ***Dr. Th. E. Schouten***, The Netherlands, ***Dr. M. C. J. D. van Eekelen***, The Netherlands, ***Péter Kenesei***, Hungary, ***Alexander Nemsadze,*** Georgia

• Ecology / Environmental Sciences

I. prize:	**Leonie Faller**	Germany
	Jelena Bazar, Natalya Buko	Lithuania
II. prize:	**Anton Mironov**	Russia
	Andy Luijben, Eric Woelk	The Netherlands
III. prize:	**Nadya Yatsenko**	Belarus
	Carien Alingh,	
	Chantal Panman	The Netherlands

Jury: ***Prof. Dr. J. M. van Groenendael***, The Netherlands, ***Prof. Dr. P. H. Nienhuis***, The Netherlands, ***Dr. W. J. J. M. Scheenen***, The Netherlands, ***Dr. Andrey Timoshchenko***, Belarus, ***Jochen Butzer***, Germany, ***Prof. Dr. Alexander Bogoljubov***, Russia

Mathematics section

Physics

• Mathematics

I. prize:	**Koki Glonti**	Georgia
	Oleg Mikhaylovskiy	Russia
II. prize:	**Danila Fandeev,**	
	Daniil Hritoshin	Russia
	Vladimir Trubnikov	Russia
III. prize:	**Eliza Rezvanova**	Russia
	Nana Gobadze	Georgia

Jury: ***Prof. Dr. F. J. Keune***, The Netherlands, ***Dr. R. H. Kaenders***, The Netherlands, ***Dr. L. van Schalkwijk***, The Netherlands, ***Dr. M. Meskhishvili***, Georgia

One of the most interesting presentation

Beekvliet: Clean or not?!

Winner: Van Melsen Prize Radboud University Nijmegen 2004
Students: **Moniek van der Heijden en Steffy Jansen**
Teacher: Gerard van Boekholt
School: Gymnasium beekvliet, Sint Michielsgestel

Introduction
We wanted do research on animals; it became research on bacteria because they are easier to handle. We saw some spilt milk on the doors of the cantina and thought about the cleaning of our school, we could do our research on that. Are bacteria really removed by cleaning?

Hypotheses
The cleaning of Beekvliet is done in such a way (with accurate means and tools) that our school is free of bacteria.

Theory
Bacteria are relatively small, simple, unicellular micro organisms *(Figure 1.).* Bacteria are. Unlike cells of animals and other, bacterial cells do not contain a and rarely harbour. The bacterial cell is surrounded by a membrane, or, which encompasses the contents of the cell and acts as a barrier to hold nutrients, and other essential components of the within the cell.
Around the outside of the cell membrane is the bacterial. Bacterial cell walls are different from the cell walls of and, which are made of and, respectively. Bacterial cell walls are made of, which is made from long chains cross-linked by shorts.

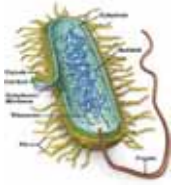


Figure 1.
Example of a bacterium

Materials and Methods
Q-tips are used to swap for samples at different spots *(Figure 2.).* Bacteria are cultured on agar-plates and individual colonies will be removed for further culturing and the strands are determined.
To test the effect of detergents round tissues soaked in these detergents were put on agar-plates with colonies *(Figure 3.).*
After cleaning of the school again swaps were taken from the same spots and cultured.

Figure 2. Swapping different spots at school

Results
The Table below.

Conclusion
After cleaning still E.-coli, Staphylococcus aureus are found at several spots. The cleaning at Beekvliet is not effective on every bacterium.

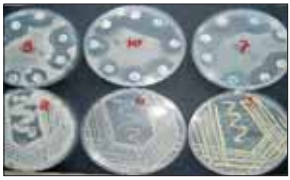


Figure 3. Petri dishes with colonies, in the above row also round tissues soaked with detergent are shown

Discussion
We proved the detergents to be effective. But after cleaning still bacteria were found on several spots, this is probably due to the way the cleaning is done. We noticed that during the cleaning the same cloth was used for different surfaces (like the toilet and the floor), without rinsing. We suggest the way of cleaning at our school is evaluated considering the results of our investigation.

Sample Number	Gram staining	Morphology		Soort bacterie
1	Gram –	Bacilli	Single	*E. coli*
2	Gram +	Bacilli	single	*Soil bacteria*
3	Gram +	Cocci	Several different forms	*Micrococcus luteus*
4	Gram –	Bacilli	Single	*E. coli*
5	Gram +	Cocci	Staphylococci	*Staphylococcus aureus*
6	Gram +	Cocci	Tetracocci	*Micrococcus luteus*
7	Gram +	Cocci	Staphylococci	*Staphylococcus Aureus*
8	Gram +	Cocci	?	*Staphylococcus aureus*
9	Gram +	Bacilli	Streptococci	*Bacillus*
10	Gram +	Bacilli	single	*Soil bacteria*
11	Gram +	Cocci	Diplococci	*Staphylococcus aureus*
12	Gram +	Cocci	Staphylococci	*S. epidermidis*
13	Gram +	Cocci	Staphylococci	*?*
14		Gram +	bacilli (yeast)	– *Yeast*

I. prize, Computer Scince

Stars far away

Péter Vingelmann
István Széchenyi Secondary Grammar School
Dunaújváros, Hungary

All of us admired the starry sky. It makes me sad that I know I can't travel to the stars. In reality it's not possible, but a computer simulation could fly us to other side of the Galaxy. I decided to write a three-dimensional simulation program which can render the Milky Way and the Solar System based on astronomical observations. I needed a lot of data and a software interface to graphics hardware which enables me to draw the stars. I used the star catalogue returned by the European Space Agency's astrometric satellite called Hipparcos. This database has a very good format, it's easy to process. From the various data I needed especially the right ascension, the declination and the trigonometric parallax of each star to calculate their position in an orthogonal coordinate-system.
The distance of a star in parsecs is the reciprocal of its parallax. One parsec is 3,26167 light years. Converting the right ascension and the declination to degrees and radians, we could map these angles to a sphere with the radius of the star's distance, and we get the coordinates of the given star. I got 118218 points in space to render. From the currently competitive software interfaces to graphics hardware, OpenGL and Direct 3D, I chose the first one because it's easy to program and very stable. My program is developed for Windows operating systems and written in Visual C++ 6.0. After creating our own window and setting its parameters acceptable for OpenGL, we are ready to render. In every frame we send a WM PAINT message to the program, the window procedure will process it and call the OpenGL commands to draw our stars as points. Using the spectral type and the magnitude of the stars, we can give them colors and brightness (with alpha-blending), which looks great. We can recognize the constellations. Of course we want to move and rotate in our 3D world. I created the Moving Object class which can implement this feature using vector and matrix operations. We can rotate with the mouse and speed up pressing the up arrow. We should render the close stars as spheres to make them more realistic. We draw a halo to the stars to make them glare. We have to recalculate the visual magnitude of each star using the absolute magnitude if their distances change. I added the Sun (Sol) to my database, and

then the planets and moons of the Solar System. I render the planets with textures loaded from BMP, TGA or JPG files. There's a lot of astronomical data about the orbit of planets and moons. So we can calculate their position in our world and using Newton's gravitational law we can simulate their motion and orbit. We can fill the Solar System with asteroids and more moons. Of course, not every celestial body is spherical. A good example is the two potato-shaped moons of Mars: Phobos and Deimos. Thus we can tour the Solar System because my program will bring us everywhere. I wrote a function which can calculate the speed and the direction to the given target. What's more we render the elliptical orbit of the planets. We can look at the Solar System and our stars from any point of view. My friends advised me to create a game from my simulation program. I thought it was a good idea because the interstellar space was so empty and needed some action to fill it. I had to supplement the galactical database. Then I downloaded so many Star Trek and Star Wars spaceship models. I put them into my program, gave them capabilities such as warp speed, weapon systems, cloaking device, shield and so on, everything necessary to a space battle. The Galaxy was divided among different species, star empires. They have gigantic starfleets which fight each other in a cosmic war. A new strategic game called Invasion was born.

The importance of the ICYS for the Radboud University in the Netherlands

We take part in the ICYS since 1999 and organised the ICYS twice. Once in 2000 (by Sjef van Groningen) and, once in 2004 (by Jan Marijnissen). We participated for ten years now: you do that only if its important.

To explain why we think it is important we want to compare the ICYS with the Olympic Games in 2000 and 2004. In those years the Netherlands were very successful in the swimming competition. We had Inge de Bruin with the ladies and Pieter van den Hoogeband with the men. Both won several Olympic gold medals. This had a great effect on all the local swimming clubs. Thousands of kids wanted to join a swimming club. The clubs got so many new members, that you had to be put on a waiting list in order to join. We know the ICYS is not the same as the Olympic Games but for us the principle is the same. We take part and organise the top in scientific research for children from 12 to 17 years and we want to get the effect that many children in ordinary Dutch high schools are willing to take part in this competition and hope that this encourages them to do real and good research for their exams.

Now we encountered a little problem we had to solve. When a country organizes the real Olympic game there is a huge coverage on television and in the newspapers. When you take part in or organise the ICYS you can do so without anyone in the country knowing. But we wanted everybody to know. So in 2000 we started with our yearbook with proceedings of the Van Melsen Prize, the national award of the Radboud University and at least two chapters about the adventures our pupils encountered taking part in the ICYS. These books with proceedings started out very modestly. The book from the year 2000 is a small book which we only sent to high schools in the direct vicinity of our University. We immediately started research on the effect of the book and in the following years we tried to apply the things we learned from the research. When we did send the book to a new region we could notice more students from that region took part in our contest the next year and more students from that region became students at our university (!). We noticed a greater effect from the books as we sent them to the high school teachers at their home addresses instead of the school addresses. So since 2004 we are sending every high school teacher (4000 in total) who teaches the subjects biology, physics, mathematics, chemistry or computer science (A level) a copy of the book to his home address. So we build the importance of the ICYS in the Netherlands ourselves. It is still an ongoing process. Since 2005 we ask the mayors of the cities the winning pupils come from, to send them a letter of congratulations (the always do), in 2006 we asked a member of the European Parliament to write such a letter and she did, in 2007 and 2008 we asked our minister of education to write such a letter and both of them did. We are not always successful, the last two years we also asked our prime minister but he still hasn't responded. But it contributes to getting us noted.

And the more we get noted the more articles in the newspapers appear every year about our Van Melsen Prize and about the ICYS. Some of these articles we reprint in our book. We put a lot of dedication in these books, we try to seduce teachers and students by making the books of good quality and to put lots of nice pictures in the books. On the website we have a photo collage from all the years we took part in the ICYS. (www.ru.nl/exo). There are also extra pictures from each year on our website.
In 2005 we made a special book of photographs about the ICYS in 2004. It was called 'Impressions' and we are very proud of it. We also sent this book to all the science teachers in the Netherlands. It got great reactions and it did get us even more noticed. We now find that schools prefer our contest over other contests because if they get nominated they get a summary which contains the name of the school in the yearbook. And all other schools in Holland take notice. Our overall conclusion is that the ICYS contributes to an increase of the awareness of young people that scientific research can be fun!

Dr. Jan Marijnissen

Entertainment

Efteling

In the Zoo

Disco

Game

Katowice, Poland, 2005

President of the LOC: ***Urszula Woznikowska-Bezak***


Katowice

Participating countries: **14**
Belarus, Brasil, Czech Republic, Georgia, Germany, Hungary, Indonesia, Lithuania, Russia, The Netherlands, Ukraine, USA, Poland, Denmark (observer)
Number of participants: **131**
Number of students: **79**
Number of leaders: **38**
Number of presentations: **67** (Mathematics: 15, Computer Science: 9, Physics: 21, Ecology: 22)


Welcome in Katowice


Opening ceremony

RESULTS

• Physics

I. prize:	**Jakub Wyrobek**	Katowice	Poland
II. prize:	**Maarten Koster**	Groningen	The Netherlands
	Alexander Joos	Stuttgart	Germany
III. prize:	**Nikoloz Maghaldadze**	Tbilisi	Georgia
	Chrisanthy Rebecca Surya and **Dhina Pramita Susanti**		Indonesia
	Grzegorz Brzezinka	Katowice	Poland
	Boris Schellekens and **Jeroen Aalders**		The Netherlands
Special prize:	**Péter Papp**	Békéscsaba	Hungary
	Frank van der Hulst and **Bjorn de Wagenaar**		The Netherlands
	Diatra Zulaika and **Anike Bowaire**		Indonesia
	Tatyana Nurullina	Moscow	Russia
	Stanisław Świerc	Glivice	Poland

Jury: ***prof. dr hab. Władysław Borgieł***, Silesian University, Katowice, Poland, ***prof. dr hab. Maciej Kolwas,*** Polish Academy of Sciences,Warsaw, Poland, ***dr inż. Kazimierz Gut***, Technical University Gliwice, Poland, ***assis. prof. Lajos Skrapits,*** Eötvös University, Budapest, Hungary, ***Prof. Dr. Valentyn Lobyshev,*** Moscow State University, Russia, ***assoc. prof. Dr. Zhylko Vitaly***, State University of Belarus, Minsk, Belarus

• Ecology

I. prize:	**Eelke Kraak**	Amsterdam	The Netherlands
	Arthur Wasylewicz		The Netherlands
II. prize:	**Rolinde Alingh** and **Annelien Mulder**	Nijmegen	The Netherlands
	Katharina Boguslawski	Stuttgart	Germany
	Miłosz Bąba and **Inga Smolarek**	Staszica w Sosnowcu	Poland
III. prize:	**Katarzyna Marondel**	Katowice	Poland
	Éva Halász	Szeged	Hungary
	Manuel Fischer	Stuttgart	Germany
Special prize:	**Michael Alexadner**	Houston	Texas, USA
	Wojciech Maruszczyk	Katowice	Poland
	Micael Rodrigo de Oliveira e Silva	São José dos Campos – SP	Brasil

Jury: ***prof. dr hab. Anna Pazdur***, Technical University, Gliwice, Poland,
prof. dr hab. Andrzej Zastawny, Technical University, Gliwice, Poland,
dr hab. Piotr Skubała, Silesian University, Katowice, Poland,
dr Izabela Franiel, Silesian University Katowice, Poland,
Prof. Dr. Andrey Timoshchenko, Sacharov University, Minsk, Belarus,
Prof. Dr. Jan Marijnissen, Radboud University, Nijmegen, The Netherlands

Presentations

• Mathematics

I. prize:	**Yaroslav Shelepko**	Saint-Petersburg	Russia
	Vladimir Trubnikov and		
	Oleg Mikhaylovskiy	Saint-Petersburg	Russia
	Lela Latsoshvili and		
	George Kukhalashvili	Tbilisi	Georgia
II. prize:	**Irakli Baiadze**	Tbilisi	Georgia
	Michał Zajda	Katowice	Poland
III. prize:	**Aleksy Alekhin**	Saint-Petersburg	Russia
	Tjitske Starkenburg	Groningen	The Netherlands
	Nikita Slushkin	Saint-Petersburg	Russia
Special prize:	**Ihar Husarevich** and		
	Lizaveta Shmarava		Belarus
	Martin Lohman	Stuttgart	Germany
	Aleksander Kolchin	Moscow	Russia
	Rati Gelashvili	Tbilisi	Georgia

Jury: ***dr hab. Maciej Sablik***, Silesian University, Katowice, Poland,
prof. dr hab. Karol Baron, Silesian University, Katowice, Poland,
dr hab. Mieczysław Kula, Silesian University Katowice, Poland,
dr Waldemar Hołubowski, Technical University, Gliwice, Poland,
Dr. Mamuka Meskhishvili, Tbilisi, Georgia,
Dr. Ilya Chistyakov, Saint-Petersburg, Russia


Experimentation

• Computer Science

I. prize:	**Levan Lapachi**	Tbilisi	Georgia
II. prize:	**Bledar Fazlija**	Stuttgart	Germany
	Piotr Niedźwiedź	Katowice	Poland
	Vladimir Pashkevich	Minsk	Belarus
III. prize:	**Nana Lemonjava**		Georgia
Special prize:	**Rafael Guedes Lang**		Brasil
	David Reis	Stuttgart	Germany

Jury: ***dr Adam Kolany***, Jagiellonian University, Cracov, Poland, ***Michał Baczyński***, Silesian University, Katowice, Poland, ***Adam Pucia,*** Youth Palace, Katowice, Poland, ***Péter Kenesei,*** Eötvös University, Budapest, Hungary, ***Aleksandre Nemsadze***, Tbilisi, Georgia

One of the most interesting presentations

Treacherous simplicity: sounds of Didgeridoo

Grzegorz Brzezinka
Grupa Twórcza "Quark" Pałac Młodzieży
Katowice, Poland

The "didgeridoo" is a simple wind instrument traditionally made by the Australian aborigines from a hollowed-out log. It is, however, a remarkable instrument because of the wide variety of timbres that it produces. Author investigates the nature of the sounds that can be produced and how they are formed.
Detailed power spectrum analysis, investigation into lips vibrations, theoretical model of didgeridoo acting as a resonance filter – all those versatile research lead to the discovery of the scheme of sound production in this unusual instrument. Not only has the author done an arduous, but valuable research, but has a lot of fun learning how to play on that simple wooden pipe as well. In addition to this, the presentation of hilarious kangaroo and owl sounds. Conclusion – pleasant and useful piece of work.

Awarding ceremony

Greetings of the Secretary General of EPS

Entertainment

Welcome on the Solemn Dinner

Slice up the big cake

Excursion to Cracow

Stuttgart, Germany, 2006

President of LOC: ***Dr. Alexander Urban***

Stuttgart

Participanting countries: **14**
Belarus, Brazil, Croatia, Czech Republic, Georgia, Germany, Hungary, Indonesia, Lithuania, Macedonia, Netherlands, Poland, Russia, Ukraine
Number of participants: **170**
Number of students: **113**
Number of leaders: **40**
Number of presentations: **92** (Mathematics: 11, Computer Science: 18, Physics: 19, Technical Physics: 19, Environmental Sciences: 16, Life Science: 9)

Opening ceremony

RESULTS

• Mathematics

Advanced Mathematics

I. prize:	**Dmitry Todorov**	Russia
II. prize:	**Jaroslav Shelepko**	Russia
	Alexander Neshitov	Russia
III. prize:	**Alexander Lepkin,** **Dmitry Kormanovsky** and **Roman Zinatulin**	Russia

Basic Mathematics

I. prize:	**George Mikhadze** and **Lado Meskishvili**	Tbilisi	Georgia
II. prize:	**Nick Gigashvili** and **Zauri Soidumati**	Tbilisi	Georgia
	Levan Varamashvili	Tbilisi	Georgia
III. prize:	**Anna Ściaźko**	Katowice	Poland

Jury: ***Gerhard Jung,*** Germany, ***Mamuka Meskishvili,*** Georgia, ***Michael Lehn***, Germany, ***Daniel Nolte,*** Germany, ***Ilja Chistjakov,*** Russia

• Computer Science

I. prize:	**Piotr Niedzwiedz**		Poland
II. prize:	**Djurre van der Wal** and **Freark van der Berg**		The Netherlands
	Arber Fazlija	Stuttgart	Germany
III. prize:	**Andrei Budnik**	Minsk	Belarus
	Peter Dieterich	Stuttgart	Germany

Presentations

Jury: ***Buehler Fabian*****,** Germany, ***Nemsadze Alexander***, Georgia, ***Goce Dokoski***, Macedonia, ***Dmitriev Konstantin***, Russia, ***Adam Pucia***, Poland

• Environmental Sciences

I. prize:	**Lana Stimac**		Croatia
	Marcell Takács	Debrecen	Hungary
	Jörg Gramich	Stuttgart	Germany
II. prize:	**Larisa Music**		Croatia
	Wojciech Chrobak		Poland
III. prize:	**Tereza Bendlova**		Czech Republic
	Ana Grasevich		Lithuania
	Igor Ogashawara		Brasil
	Victor Paolilo Neto		Brasil

Jury: ***Valentin Lobishev***, Russia, ***Gerhard Greiner***, Germany, ***Gerhard Braun***, Germany, ***Alex van der Berg***, The Netherlans, ***Irina Malisheva***, Ukraine

• Life Science

I. prize:	**Albert Konijnenbe** and		
	Mandy Mandy		The Netherlands
	Veronique van Zelm and		
	Marit van der Hoek		The Netherlands
II. prize:	**Martin Vögele**	Stuttgart	Germany
	Olaf Merkert	Stuttgart	Germany
III. prize:	**Willianne Ligthart** and		
	Anouk van Duin		The Netherlands
	Maja Zvorc		Croatia

Jury: ***Jan Marijnissen***, The Netherlands, ***Žaklin Luksa***, Croatia, ***Juergen Tomiuk***, Germany, ***Claudia Stegmaier***, Germany, ***Doris Baechle-Knauer***, Germany

Presentations

• Physics

I. prize:	**Ursula Sojc**	Stuttgart	Germany
	Patryk Pjanka and		
	Magdalena Kopoczynska		Poland
II. prize:	**Maxi Frei**	Stuttgart	Germany
	Márton Kőrösi	Békéscsaba	Hungary
	Andrey Voloshin		Russia
III. prize:	**András Zsidó**	Dunaújváros	Hungary
	Zulfikar Hakim		Indonesia
	Bartlomiej Janczak and		
	Joanna Oracz		Poland
	Natasya Maura		Indonesia
Special prize:	**Andriy Kazachkov**	Harkiv	Ukraine

Jury: ***Hans Jordens***, The Netherlands, ***Ozimar Pereira***, Brasil, ***Lajos Skrapits***, Hungary, ***Monika Raharti***, Indonesia, ***Maciej Kolwas***, Poland

Student's discussion and the jury

• Technical Physics

I. prize:	**Frantisek Sedlak**	Czech Republic
	Lisanne Fest and	
	Nadine van Iperen	The Netherlands
	Sander Staal and	
	Jordi Dekker	The Netherlands
II. prize:	**Manuel Fischer**	Germany
	Pavel Solný	Czech Republic
	Oleg Baskakov	Russia
III. prize:	**Aneta Michalska** and	
	Karolina Janczak	Poland
	Ákos Vajda	Hungary
	Adam Janečka	Czech Republic

Special prize: **Ilija Stevanoski** Macedonia
Vladimir Dzidzaleski Macedonia

Jury: ***Carsten Hundegger***, Germany, ***Mario Mosbacker***, Germany, ***Cezary Filipiuk,*** Poland, ***Sergei Sergeev***, Russia, ***Paul Pshenichka***, Ukraine

Awarding ceremony

The medals

One of the most interesting presentations

Country: Netherlands, **Team:** NL2,
Name: **van der Hoek, Marit; van Zelm, Veronique,**
ID: NL2-MvdH-Stu, NL2-VvZ-Stu,
Presentation ID: LS-NL2-MvdH/VvZ

Wake Up And Smell The Pheromones!!!

On our school we often see youngsters fall hopelessly in love with each other. It isn't unusual for their friends or classmates, to wonder what in the world could those people find attractive about each other.
The Austrian scientists Karlson and Butenandt had some idea as to what could be behind these sudden and strong attractions between humans. In 1959 they came up with the term pheromones. "Pheromones are substances excreted by an animal to the external environment, which trigger a specific reaction in a receptive individual of the same species; this reaction consists of either a physical change, or a specific behaviour."
We wondered if this could explain those unlikely school romances. We wanted to know if pheromones could play an important role in the way a person judges someone of the opposite sex. This led to the hypothesis; subjects will judge unknown models more positively after exposure of a high level of pheromones.

In our experiment we chose 54 male and 34 female students in the age of 14 to 16 years. Subjects where restricted from the use of deodorant and had to run several hundred meters. They both had a piece of gaze in their armpits. As pheromones are excreted through the skin and detected by a tiny organ in the nose called the vomero nasal organ, we would make our subjects smell the sweatgases with pheromones. Each male had to sniff three gases worn by the opposite sex and vice versa.
We presented each subject with randomized pictures of unknown models of the opposite sex extracted from internet. The subjects had to fill in a questionnaire of 8 questions on a five point scale, ranging from very negative to very positive. This allowed us to derive a score from the questionnaire for each model.
We repeated this test after 55 days without the gases containing pheromones.
So in what way does a young person judge a person of the opposite sex differently when exposed to a heightened concentration of pheromones? From our data we may conclude that exposed subjects judge the models more positively. Boys and girls alike judge models of the opposite sex more positively after exposure to a higher concentration of pheromones. Girls however are more receptive to the effect.

This is in accordance with the research of Justin Benore of the Colorado State University who wrote, “From the compounds listed in my paper, it is interesting to note that all naturally occurring pheromones appear to be targeted towards females. This could be seen simply as part of the process of selecting a suitable mate. These cues may have been (and continue to be) necessary for a woman to accept the sexual advances of a male.”
A fun detail is the effect pheromones had on the girls’ answers to the question “would you laugh if this person made a stupid joke” Girls exposed to a high level of pheromones where significantly more willing to laugh at stupid jokes made by boys then they normally would.
So if you’re not particularly skilled at making girls laugh; it may be a good idea to jog to your school or job and maybe to shower less often...

ICYS in Germany

Short analysis and evaluation

Bosch Haus

The ICYS 2006 in Stuttgart has been carried out in a secondary school during the Easter-Holidays. Therefore enough class-rooms and the infrastructure of the whole building was available. The Youth Hospital and the Backpacker Hostel were within walking distance to the school which simplified the organization. Because of a large spread of the scientific level in mathematics this special competition has been divided in two parts: advanced mathematics and basic mathematics. The main sponsors have been the Heidehof Stiftung and Robert Bosch Company. One of the highlights of the program was the excursion to **Bosch Company** where different projects in automotive development have been presented.

The Stuttgart Newspapers published some articles upon ICYS which was a significant support for the local programs in promoting talented students.

The importance of ICYS


22 STUTTGART

Besser Schweiß als Deo

Junge Wissenschaftler auf Konferenz ausgezeichnet

Neugierig auf die Entdeckung von Parkovorschaften


Jungforscher üben auf internationalem Parkett

Promoting talented students is one of the most important measures for keeping the country among the top nations in science and technology also in future. Of course this is well known but too less boys and girls are focusing their interests in sciences. ICYS in Stuttgart was a proof that sciences are not only difficult and hard to learn but moreover they are fascinating and an occasion for contacts and friendships with young people from all over the world.

Dr. Alexander Urban

Entertainment

Excursion to the Kepler Museum

Farewell party

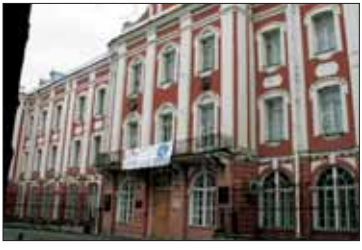
Visit of the „Stuttgarter Frühlingsfest"

Saint-Petersburg, Russia, 2007

President of the LOC: ***Ilja Chistjakov***

Sainkt-Petersburg

Participating countries**: 13**
Belarus, Brazil, Hungary, Germany, Indonesia, Lithuania, Macedonia, The Netherlands, Poland, Russia, The Ukraine, Croatia, Czech Republic
Number of participants: **165**
Number of students: **117**
Number of leaders: **42**
Number of presentations: **76**



State University of Saint-Petersburg

Opening ceremony

• Computer Science

I. prize:	**Tamás Sümegi**	Tab	Hungary
	Dmitrenko Kirill	Moscow	Russia
	Peter Kovalev	Saint-Petersburg	Russia
	Gridnev Maxim	Saint-Petersburg	Russia
III. prize:	**Anatoli Tsyporyn**	Minsk	Belarus
	Gushin Elisey	Saint-Petersburg	Russia
	Dmitriy Ivanov	Saint-Petersburg	Russia
	Daniil Ovchinnikov	Saint-Petersburg	Russia

• Mathematics

II. prize:	**Bruno van Albada,** **Valentijn Karemaker** and **Brigitte Sprender,** **Willem Schilte,** **Jesse Hoekstra** and **Petra Alkema,**		The Netherlands The Netherlands
	Alexander Neshitov and **Kirill Batalkin**	Saint-Petersburg	Russia
III. prize:	**Michael Glushchenko** and **Pavel Perestoronin**	Minsk	Belarus
	Uspenskiy Eugeny	Saint-Petersburg	Russia
	Alexander Shchegolev and **Konstantin Tyapochkin**	Saint-Petersburg	Russia
Special prize:	**Smolensky Andrey**	Saint-Petersburg	Russia
	Binder Jan	Stuttgart	Germany

Presentations in historical rooms

• **Ecology**

I. prize:	**Pedro Paulo Alves Cardoso de Andrade**		Brasil
	Talen Antony and Cristian Helder		The Netherlands
II. prize:	**Igor Ogashawara**		Brasil
	Schlueter Alexander		Germany
	Marta Wierzcholska		Poland
	Maria R. Ekindriaty and		
	Heidi Ongkowijaya		Indonesia
III. prize:	**Larisa Mušić**		Croatia
	Lingstaedt Robin,		Germany
	Denis Leiner		Croatia

• **Physics**

I. prize:	**Justina Chromik**		Poland
	Andrey Andreev		Minsk, Belarus
	Rafał Hibner and **Mateusz Polnik**		Poland
II. prize:	**Mariya Chernysheva**		Moscow, Russia
	Zimmerman Marco		Germany
	Márton Kőrösi	Békéscsaba	Hungary
	Reiner Johannes	Stuttgart	Germany
III. prize:	**Karolina Janczak**		Poland
	Ostermaier Florian		Germany
	Yulia Pshenychka	Chernivtsi	Ukraine
	András Király	Szeged	Hungary
	Noud Brasjen and		
	Sjoerd Huininga		The Netherlans
	Kamil Maszkowski and		
	Bartlomiej Kadzielawa		Poland
Special prize:	**Orsolya Pipek**	Budapest	Hungary

ICYS in Saint-Petersburg

It was decided to organize the International Conference of Young Scientists (ICYS) in Saint-Petersburg in April 2007 which is one of the most prestigious European International Scientific contests.
117 Students from 14 countries (Belarus, Brazil, Hungary, Germany, Greece, Indonesia, Lithuania, Macedonia, the Netherlands, Poland, Russia, Ukraine, Croatia and Czech Republic) took part on the conference and in four sections, – Mathematics, Ecology, Computer Science and Physics – presented their research report.
It was quite natural that the opening ceremony of the conference took place in the Assembly Hall of the historical building of State University of Saint-Petersburg at 25 April.
At the beginning the participants were greeted by the Minister of Information Technologies and Communication of Russian Federation. Then participants came in touch with the scientific traditions of Russia as they had opportunity of listening to the speeches delivered by notable scientists of the State University of Saint-Petersburg and members of the jury. The Head of Organizing Committee addressed the Conference. The ceremony was completed by concert of the singer from Mariininsky Theatre. All guests lived in the hotel of the Palace of the Youths in the centre of the city.

The conference itself began on 26 April with the session of scientific jury in the building of Union of Architects that is famous for its interiors.
The reports made further were distinguished to be very interesting.
Professors from leading Russian Universities worked in the jury: ***Nicholas Shirokov*** (head of the jury, Russia, St. Petersburg), ***Alexander Liaptsev*** (Russia, St. Petersburg), ***Sergei Sergeev*** (Russia, Moscow), ***Valentin Lobishev*** (Russia, Moscow), ***Nicholas Vavilov*** (Russia, St. Petersburg), ***Alexander Fradkov*** (Russia, St. Petersburg), ***Dimitri Shtukenberg*** (Russia, St. Petersburg), ***Stanislav Kublanovskiy*** (Russia, St. Petersburg). The jury also included representatives of the participating countries. The organizing Committee tried to make this visit unforgettable. The participants visited the ***Hermitage***, the ***Russian Museum***, the ***Saint Isaac's Cathedral***, and palaces in the country. Young people tried to find some sights themselves during the game held during their free time. The conference was finished on 29 April in the Assembly Hall in the building of the Union of Architects where 35 of the participants were awarded by medals and diplomas.
The scientists and their students who came to Saint-Petersburg represented the results of their work to people reciprocating their interests in the atmosphere of mutual interest and support along with interesting excursions and entertainments that could take place only in such a wonderful city as Saint-Petersburg – the cultural and scientific centre of Russia.

Ilya Chistjakov

Abstracts of some winner's presentations

III. prize in Physics

High voltage discharge in graphite dust

Yuliya Pshenychka
Gymnasium N°1
Chernivtsi, Ukraine

Introduction
The goal of this paper is to analyze which properties of the graphite facilitated the discharge in a high voltage electrical field at lower grades of field tension as necessary for such a discharge in pure gas under normal conditions (pressure and temperature). We also investigated the possible effects assisted the subliminal discharge.

Experimental part

1. We used the induction coil to get a common high voltage discharge in air at an approximately 10 kV/cm electric field tension *(Fig. 1.).*
2. After increasing of the distance between the electrodes the discharge stopped. Then we putted some graphite powder between the electrodes till the discharge appeared at once. The shape of the discharge changed, and we could see coloured streamers developing in the area surrounding the electrodes *(Fig. 2.).*

Fig. 1. Common discharge

Fig. 2. Streamers

Theoretical part

What we saw in the second experiment was the development of positive and negative streamers caused by help of a new amount of electrons. We supposed four possible ways to enable the appearance of additional free electrons in the space between the electrodes:
The heating of the graphite particles (size 0.01 till 0.1 mm) due to impact of high energy electrons caused additional thermal (thermionic) electron emission.
The second electron emission.
The photoemission.
We suppose that the first hypothesis is the most appropriate. We made such conclusions depending on the special properties of graphite:

1. Graphite can conduct electricity due to the vast electron delocalization within the carbon layers. These electrons are free to move, so are able to conduct electricity. However, the electricity is mainly conducted within the plane of the layers
2. Considerable specific resistance (8 Ω mm^2/m).
3. Graphite is an extremely strong, heat-resistant (to 3000 °C) material.
4. The photoelectric work function of graphite is.

References

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Chikovani G. E., Ronishvili V. N., Mikhailov V. A., Operation Mechanism of the Track Spark Chamber, "Nuclear Instruments and Methods", 1964 v.29, p. 261.
Chattarji D., The Theory of Auger Transitions, L. – N.Y., 1976.

Preparing the diplomas and the medals

Awarding

Entertainment


Saint Isaac's Cathedral


The Hermitage


Summer Palace of Catherine the Great

Chernivtsi, Ukraine, 2008

President of the LOC: ***Paul Pshenichka***

Chernivtsi National University

Participating countries: **15**
Belarus, Brasil, Chezh Republic, Croatia, Georgia, Germany, Hungary, Indonesia, Lithuania, Macedonia, Poland, Romania, Russia, The Netherlands, Ukraine
Number of participants: **153**
Number of students: **83**
Number of leaders: **50**
Number of presentations: **73**

Opening ceremony

RESULTS

• Mathematics

I. prize:	**Lado Meskhishvili, Levan Grdzelishvili**	Tbilisi	Georgia
	Michael Shkolnikov		Russia
	Shota Samsonadze	Tbilisi	Georgia
II. prize:	**Alexey Medvedev, Mikhail Rotkevich**		Russia
III. prize:	**Minets Aliaksandr**		Belarus
	Mari Nutsubidze		Georgia
	Irakli Saralidze, Roman Chalidze		Georgia

Special prize:	**Levan Varamashvili, Tamuna Bachtadz**	Georgia
	Luka Jikia	Georgia
	Ali Muhammad Sadhra	Indonesia
	Raphael Reinauer	Germany
	Kateryna Gryzun	Ukraine

Jury: ***Olekcandr Sobchuk,*** Ukraine, ***Mamuka Meskhishvili***, Georgia, ***Ilja Chistjakov***, Russia, ***Zurab Aghdgomelashvili***, Georgia, ***Sobchuk,*** Ukraine

- **Computer Science**

I. prize:	**Przemysław Elias, Michał Psota**	Poland
	Dániel I. Buza	Hungary
II. prize:	**Kate Gobadze**	Georgia
	Aliaksandr Tsiarenia	Belarus
III. prize:	**Dmitriy Borisevich**	Russia
	Vladimir Yamschikov	Russia
	Lena Kiselyova	Ukraine
Special prize:	**Ahmad Alkadri**	Indonesia

Jury: ***Yaroslav Viklyuk,*** Ukraine***, Viktor Savelyev***, Ukraine, ***Yulia Panasyuk***, Ukraine, ***Vitaly Zhilko,*** Belarus, ***Igor Ogashawara***, Brasil, ***Zarine Aršakuni***, Czech Republic, ***Alexander Nemsadze***, Georgia, ***Viktor Vyalov,*** Russia, ***Konstantin Dmitriev,*** Russia

- **Physics**

I. prize:	**Driessen Lars, Sprangenberg Tom**	The Netherlands
II. prize:	**Felix Lorenz**	Germany
	Ilka Vincon	Germany
III. prize:	**Ranu Firman Wahyudi, Diatra Zulaika**	Indonesia
	Yuliia Pshenychka	Ukraine
	Johan Anantha Cahyadi	Indonesia
	Ivan Kortunov	Russia
Special prize:	**Dimas Hokka Pratama**	Indonesia
	Chrisanthy Rebecca Surya	Indonesia

Presentation and the jury

• Engineering Physics

I. prize:	**Jelle van Mourik** and	
	Josse van Dobben de Bruyn	The Netherlands
II. prize:	**Zsolt Heizler**	Hungary
	Klaas Jelmer Boskma	The Netherlands
III. prize:	**Piotr Sochacki**	Poland
Special prize:	**Kamil J. Dudek**	Poland

Jury: ***Hans Jordens,*** The Netherlands, ***Lajos Skrapits***, Hungary, ***Zdenek Kluiber***, Czech Republic, ***Sergei Sergeev***, Russia, ***Maciej Kolwas,*** Poland, ***Sjef van Groningen***, The Netherlands, ***Judit Illy,*** Hungary, ***Ushenko Yurij,*** Ukraine, ***Oksana Voitsekhivska***, Ukraine, ***Andrij Savchuk***, Ukraine, ***Alexander Urban***, Germany, ***Oleg Angelsky***, Ukraine, ***Nataliia Polikhun,*** Ukraine, ***Cezary Filipiuk***, Poland, ***Monika Raharti,*** Indonesia

• Ecology and Life Science

I. prize:	**Ena i Iva Pritišanac**	Croatia
II. prize:	**Lynn Kaat Laura Kurniawan** and	
	Terrenz Kelly Tjong	Indonesia
	Thomas Thijs	The Netherlands
III. prize:	**Pandu Prabowo Jati,**	
	Dewi Okta Anggraeni	Indonesia
	Patricia Simina Muresan	Romania
	Christa Blokhuis,	
	Christine Bruggeman, and	
	Kristel Schoonderwoerd	The Netherlands
	Anastasiya Nazarenko	Ukraine
Special prize:	**Andreas Mayer**	Germany

• Environmental science

I. prize:	**Petar Čuček**	Croatia
II. prize:	**Kateryna Nikolyukina**	Ukraine
	Victor Paolillo Neto	Brazil
III. prize:	**Jelena Dashkevich, Valerij Olechnovich**	Lituania
	Anne Wannenwetsch	Germany
	Mateusz Pelesz	Poland
Special prize:	**Anna Vogelová**	Czech Republic
	Michał Fita	Poland
	Jorien Rippen, Esther van Wijk and	
	Eva van der Woude	The Netherlands
	Aleksandra Mrozińska	Poland
	Ilieț Bianca, Pețtean Valentin	Romania

Jury: ***Jan Marijnissen***, The Netherlands, ***Václav Skočdopole***, Czech Republic, ***Valentin Lobyshev,*** Russia, ***Roman Volkov***, Ukraine***, Dmytro Babyuk***, Ukraine, ***Grishko Svetlana***, Lithuania, ***Antonio Augusto Frazao***, Brasil, ***Marijana Krsnik-Rasol***, Croatia

Some of the awarded presentations

Physics section III. prize

The Absolute Heat Exchanger

Yuliia Pshenychka
Gymnasium #1, 11th form
Chernivtsi, Ukraine

Is it possible to heat 1 kg water having a temperature of till more than using 1 kg boiling water having a temperature of in a pure heat exchanging process? For the first look it seems impossible, but the answer is yes. There are two ways to manage it. **1.** Dividing the hot water in n equal parts you can heat the not divided reservoir of cold water till approximately. **2.** But if you divide both the cold and the hot water in many portions you can reach the total exchange of temperature: the cold water will become and vice versa.

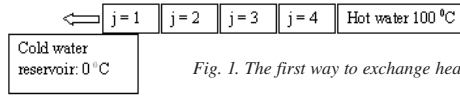

Fig. 1. The first way to exchange heat

Theoretical model

1. After every portion of hot water exchanged the heat energy with the reservoir of cold water its temperature would be: $t^0 = 100^0 \cdot (1-1/(1+1/n)^n$, where n is the number of hot water portions. As an example – if n = 20; 50 and 100 – the temperature of the cold water will be correspondingly; 62,3 °C; and 62,85 °C. If $n \to \infty$ the temperature of cold water has a limit of 63,21 °C according to the formula:

$$t = 100^0(1-1/e) \quad (1)$$

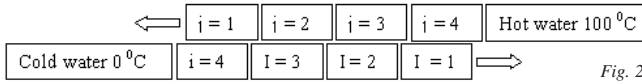

Fig. 2.

2. If we divide into n portions both cold and hot water and direct them one against another (*Fig. 2.*) the final temperature of the first portion of cold water after exchanging temperature with all portions of the hot water will become and vice verse. The resulting temperature of the each next heat exchange for a definite couple of portions i and j can be presented as an $n \times n$ 2D matrix. The *i,j*-elements of every temperature matrix cell can be defined by the recurrence relation $t_{i,j} = (t_{i-1,j} - t_{i,j-1})/2$. The analytical formula for a chosen temperature matrix element will be:

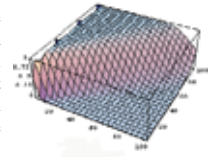

Fig. 3.

$$t_{i,j} = \frac{1}{2^{i+j}(i-1)!}\sum_{k=1}^{j} 2^k \frac{(i+j-k-1)!}{(j-k)!} \qquad (2)$$

The 3D presentation of this formula *(Fig. 3.)* was drawn using MathCad. For the purpose of simplicity we substituted 100 °C for 1 (drawing and formula).

Fig. 4.

Experimental methods

Such a heat exchange can be arranged by the following device *(Fig. 4.).* The hot and cold water flows against one another in narrow pipes with rectangular cross-section.

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I. prize in Computer Science

Recognition of movement patterns by computer

Dániel I. Buza
Széchenyi István Secondary School, Grade 9
Budapest, Hungary

In our days the user identification is a very important problem. There are some traditional identification ways (passwords, PIN-codes, etc.) but these are not too safe. For example is Joe says to Jeff his password is the word *lamp*, then Jeff has access to the secret like Joe.
There are some new identification ways (based on fingerprints, iris, DNA and speaker recognition). These have different problems. The identification based on fingerprints or iris is not too safe, because these only static pictures. The problem with the speaker recognition is that there are very good recorders and players. So everyone can replay a voice with very small things. The DNA recognition is simply too expensive ($1000), and slow.
There are another new identification ways. One of them is the identification based on movement patterns. At this way the user is identify by a drew pattern. In this way not just the made picture is important. The speed of the drawing is very important too.
Another advantage of this way is to record and replay a movement is very hard. Of course you can make a robot which can draw the same with me, but it will be too knock out. For example in a bank you can't say "This robot will draw my pattern". To learn a pattern is nearly impossible because when we are child we learn how to write the letters. So now we can't learn how another person writes a letter.
As a conclusion we can say that the new technology is safer and cheap ($8). So I started to do tests, and I developed a program which can identify a user based on a pattern. You have to draw the pattern on a touch pad of a laptop. A touch pad is very good, because from the programmers viewpoint it is equals with the mouse, but you can draw on it.

The program consists of three main parts: user's addition and cancellation procedures, testing procedure. First you have to make a new user. You have to type your name than you have to draw your patterns five times. Now you can test the identification. First you have to type your name, than you have to draw your pattern only once. The program can separate parts of the pattern. For example is the pattern is the word *apple* the program will separates it to an letter *a*, letter *p*, letter *p* again, letter *l*, and a letter *e*. The program doesn't protect any information or operation. It is only tell the drawer of the new pattern is the same with the writer of the old patterns or not.

The developed methods, the pattern reader and comparer methods are not useful just in the identification. Handwriting recognition is similar to the identification. This time the program compares the entered movement pattern with the already stored movement patterns, at which it is known what movement pattern originated from writing in the individual letters. The program converts the new movement patterns into letters, and at the end of its running writes them in a file.

A program assisting to teach the characters of an "exotic" language (Japanese, Chinese, Russian, Arabic, Hebraic, etc.) may operate like the above described one. In this case the program will request the user to write in a definite character, and it compares this with a prefabricated pattern.

Programme on the Closing Ceremony

Awarding

Entertainment


Khotyn fortress


Khotyn fortress inside


Kamyanets fortress


Excursion to other historical places of Ukraine

Impressions

Fifteen years of ICYS

In 1994 I was asked to investigate if The Netherlands would be interested to participate in the International Conference of Young Scientists. ICYS was than a brand new competition born out of a co-operation between Belarus and Hungary. So when I arrived in Visegrad, Hungary as an observer, I was full of expectations about what I was going to see. And how much was I pleased in what I saw. In essence the competition has remained her character: youngsters giving a report about their research and defending it in front of peers and a jury of specialists.

The concept fitted perfectly in the curriculum that was recently adopted in The Netherlands as well as in other countries. In stead of passive learning, students of secondary education are stimulated to active learning by researching a problem often proposed by themselves. This turns out to be a very stimulating learning tool. But being present at an internal conference where you are able to present the results of your own work is even far more stimulating.

So after one more year The Netherlands were able to send a team to ICYS and from that time on we have been participating. By time the ICYS has grown to an adult competition in which teams from many countries from all over the world participate.

Sometimes the question is raised if there are not too many competitions available, in my opinion there never can be too many. These competitions are very different in character and appeal for that reason to different types of students. The ICYS in fact is far closer to the reality of the world of research than for instance a competition like the Physics Olympiad which is much more like an exam where one has to show skills in physics and mathematics in solving closed problems. Doing research is per definition not a closed problem situation. In the contrary, research might even lead to more questions than answers. Daring to walk on unpaved roads and being able to report on that, is very challenging indeed. I have been witness in the ICYS of reports from students that could easily meet the work of professional researchers. The enthusiasm with which these students were able to share their results with their peers was hart warming. And not just a few times careers in science started there. That is the force of ICYS: the ingenuity of one student stimulates others to follow the same route.

In contrast to mono disciplinary and individual competitions, ICYS turns out to be very attractive to girls. It is paramount that the participation of girls in ICYS is much higher than in many other competitions. This is a very important feature. The number of female scientists is still lacking behind and I am convinced that due to that we are losing talents what we cannot afford in a world where we are faced with so many problems still to be tackled.

Though ICYS is a competition where the participants are competing against each other, as a consequence of which there can only be a few winners, there are however in fact no losers. That feature makes ICYS very special and different from other competitions. Not being a winner does not mean that you have failed. Someone else was simply better. And that is exactly what competitors in ICYS feel. There is nothing wrong in admitting that someone else did a better presentation or maybe their research was set up in a more sophisticated way. Winning or not winning is just relative.

ICYS has grown from six participating European countries in 1994 to eighteen countries from all over the world in 2009. That is achieved not in the least due to the efforts of the President and founder of the ICYS: Dr. Zsuzsa Rajkovits. She got the idea of ICYS and she worked hard, year after year, to have ICYS continue. Nowadays ICYS has become a grown up member within the family of science competitions and I am sure it will steadily grow so that many more students may experience the joy of being part of the world of science.

Hans Jordens
Vice-president of the ICYS
President of the WFPhC
President of the IPhO

Fifteen years of ICYS

International Conference of Young scientists is fifteen years old. This is wonderful age!!!Not childhood neither adolescence, one knows what is nice, interesting and one have all life and possibilities ahead!!! I think that ICYS has this great prospective, being well established meeting, and having successful past.

One can ask why is like that, what are the reasons of the success?

ICYS was created by Zsuzsanna Rajkovits just to give another possibilities that existed in that moment for working with gifted pupils. There were Olympiads to compete in between students having unusual knowledge in a science discipline and possibility and will to show it. There were Young Physicists Tournaments for working in ensemble, loving to solve and investigate problems proposed by somebody, loving to discuss and to … argue with another, having different opinion or just for fun.

But there is another type of people, they like just investigation, coming deeply inside the problem, constructing sometimes crazy construction. Just because of curiosity, because of internal driving force to explore something not yet explored or something which seems to be not explored yet. With total freedom of choice of the subject. For such young people Zsuzsanna Rajkovits proposed ICYS – just presentation of scientific (from time to time semi-scientific) work and confronting results with opinion of older friends, scientists and teachers participating as jury members. This simple formula attracts "teams" from whole world, starting from Indonesia, Brasil, European Countries, India etc. Students present their works but what is also very important they spend time together in multi cultural group. In any case they know each other very well just after one day, just like young. Than small and may be even bigger likings arise, short and long time friendships, internet and personal connections… This is this additional value to science, or may be science is an additional value to social ones, who knows.

I've participated in ICYS, as a jury member in physics few times : twice in Katowice, where ICYS was organized by team from Youth Palace under supervising of Ursula Woźnikowska-Bezak, than in Russia, in Saint-Petersburg, in Ukraine in Chernivtsi and in Stuttgart. What was essential in these meetings – apart of amazing young scientists and their presentation? For me it was possibility to enter into "the society" of organizers coming together with students. They are teachers, scientists, organizers of science clubs etc. All extremely kind and enthusiastic about … giving their enthusiasm of learning through investigation of Nature. Very friendly to pupils and to each other. Always ready to give an advise to correct mistake and to say words of high appreciation of student's work. Work done mainly during free time, time stolen from another occupation.

After all activities, during long evenings until early mornings we were talking, discussing, singing songs, with glass of wine or without. Trying hot and green pepper always brought by Lajos.

To this people, Zsuzsa, Lonia, Ula, Paul, Gia,Valentin, Alex, Hans, Lajos, Sergei and many other I would like to direct my deepest congratulations -because you give passion to pupils assuring that next generation will love science and like each other or vice versa. It is the privilege and honor to be your friend.

Maciej Kolwas
President of the European Physical Society

Romanian competitors at the International Conference of Young Scientists

The agreement signed in 1996 by the Departments of Physics of the Eötvös Loránd University of Budapest and the Babes-Bolyai University of Cluj concerning the organization of selections in Romania, assured the participation of the secondary school students from Romania at the *International Conference for Young Scientists*. Zsuzsanna Rajkovits PhD, one of the chief organizers of the competition requested the author of the present material to organize the preliminary selections. The call upon, organization and popularization of the competition has been supported by the Babes-Bolyai University and the local school-inspectorates as well as the Hungarian Technical Scientific Society of Transylvania. The secondary school students selected to participate at the final, international round of the competition, are those who, during the preliminary rounds presented truly individual, original and new results, and were able to present their work in English language.

The final round of the 1996 competition that took place in Visegrád, Hungary was the first one where students from Romania participated, and they won the first prize in Physics, and second prizes in the field of Mathematics and Environmental protection. Since then our competitors won a first and a third prize in 2000, at the competition organized in Nijmegen, in 2001 in Katowice, as well as a first prize in Physics at the competition organized in 2003 in Prague. In these years several members of the Romanian team also received diplomas of merit.

The true value of this event may not be expressed only through the number of the prizes won. The competition is an outstanding event, first of all because of its talent spotting and talent nursing character: it offers a unique opportunity to recognize, prepare and develop students' skills. On the other hand, the competition itself offers a unique experience that may influence the competitors' future career. Furthermore, as research implies responsibility and hard labour, it may contribute to the healthy development of their personality. Beside all these, the competition fills an important gap, because when it was launched, similar events for young researchers did not exist. The knowledge of English language facilitates the establishment of friendship and relationship between competitors from different countries and cultures, this being a nice practical example of intercultural contact.

The most important value of the competition lies in the brilliant atmosphere created by the organizers who assure pleasant conditions, various trips and events, as well as by the fevery atmosphere and the honest competing spirit that occurs only among young people of this category. I have participated at many conferences organized for adults, but the enthusiastic atmosphere created by these young, sincere competing parties eclipses everything I have ever witnessed.

The preliminary rounds of the International Conference of Young Scientists welter in a great atmosphere as well. They resemble a feast and are the celebration of science and students' creativity that bears the same characteristics as the great final round. It is an excellent opportunity to establish new friendships and exchange experience, as well as to develop one's knowledge. The winners receive diplomas and the name of those involved in conducting and leading such researches becomes well-known. These rounds are important both for the students and the teachers involved.

After joining the European Union, the teams from Romania may travel easier and there are more project opportunities to cover the related expenses. Year after year, secondary school students are increasingly eager to take part in these competitions, and we hope that we will continue to participate at the future rounds as well.

Zoltán Kovács PhD
assigned organizer from Romania

The Significance of ICYS for Research Atmosphere in Indonesia

Inline with international call in carbon emission reduction and anticipating the impact of global warming, the Government of the Republic Indonesia has been putting strong emphasis on the use of alternative energy, more efficient energy uses, and biodiversity preservation while keep maintaining the economic growth. Innovations and initiatives in relation to this issue are encouraged. Also, knowledge and technology available in this area are being reviewed for its effectiveness and further application. This makes research atmosphere in Indonesia growing more attractive day by day. The atmosphere has been induced to high school students and young researchers and has raised new spirit in exploring nature phenomena and technology invention.

The International Conference for Young Scientist (ICYS) has been well known as one of the best event for Indonesian young researcher to expose their research and invention in the last 4 years. Participating in the ICYS becomes a dream of most high school students who are interested in research in Indonesia. Since 2008, the University of Indonesia, the most prestigious university in Indonesia provides free entry for students who won medals in the ICYS. This has made greater attraction to Indonesian students to conduct research seriously. However, since the ICYS is held in Europe, the distance seems to become a great challenge to many potential young researchers to participate in. Providing a chance to Indonesia hosting the conference in Bali would open wider opportunity to students who have difficulties in time and funding to participate in the event. It would certainly improve the quality of research to be included in the conference as well as introducing the event wider in Asia-Pacific region. We believe that holding the ICYS in Indonesia could encourage the growth of national level of similar events in Indonesia. It will directly put up the quality of research conducted by young researcher to international level.

Monika Raharti
Indonesia

Memories of students

ICYS in my life

Illés Farkas
ICYS 1995, Baranavichi
Physics section

I participated at the International Conference of Young Scientists (ICYS) in Baranovichi in 1995. At that time I was in my last year at the secondary school "Apáczai Csere János" in Budapest, Hungary. The project that I presented in Baranovichi was carried out mainly during the summer before, in 1994, under the guidance of a graduate student in Computer Science. My project involved the computer simulation of a so-called "artificial life system", a computer program containing small pieces of program code that can copy (replicate) themselves.

In Baranovichi presenting scientific results in English was a challenge in itself for me, even if these were only results stemming from student research. In addition to that, we had to answer the questions of an international jury and continue with an open discussion. I think that the ICYS – just like the International Young Physicists' Tournament (IYPT) – is an excellent opportunity for students to learn that one should be happy about criticism and try to understand and apply from it as much as possible. Just a few days ago one of our manuscripts was accepted to the journal Bioinformatics, but before that during the review process we received significant criticism about our work from the reviewers. I think that the ICYS can teach students of science early enough that they should value good criticism, because it is meant to improve their work.

For both competitions our teachers in Budapest, Zsuzsanna Rajkovits and Lajos Skrapits, have helped us to do our projects and prepare our presentations. To give an example, they made me aware of the importance of estimating and measuring experimental and systematical errors when evaluating experiments. Our hosts in Baranovichi were friendly in helpful in every respect.

My parents, both engineers, always wanted me to become an engineer. At secondary school I was studying at a special class for Math and went to many Physics and Math competitions. I had some success, but was not exceptionally talented. I preferred projects that I could work on for a longer time, especially the problems of Középiskolai Matematikai és Fizikai Lapok (a journal with Math and Physics problems each month for secondary school students) where I was more successful than at competitions.

During my last two years at secondary school I was lucky enough to participate at the ICYS and the IYPT where presentation and scientific debate in English were also necessary. Again, these were projects, they involved longer preparations and in the end I had to present and discuss.

So when I was 16-17 the success at these Physics (and Math) projects lead me to the idea that I should study Physics. (Earlier, with 14, I wanted to write and translate poems, but a friend of our family convinced me that I am better at Math.)

I noticed during my last two years at school that those friends of mine, whom I knew to be smarter than myself, were going to apply to Physics (or Math) at Eötvös University. This reinforced my earlier decision to apply to Physics. My parents felt very uneasy about this. First of all, my mother wasn't sure I was smart enough for Physics. Happily, two of my teachers, Zsuzsanna Rajkovits from Eötvös University and Gyula Pákó from our secondary school, talked with my parents.

An important question of my parents was whether this career choice would give professional fulfilment

and financial safety. As for professional fulfilment, my answer was undoubtedly yes. Since then a lot has changed in my work and the answer is still yes. As for financial safety, I can say now that I have been lucky enough to start working (already as a student) with an internationally acknowledged researcher, Tamás Vicsek, at Eötvös University. Right now, five years after my Ph.D. (in Physics), I'm doing Statistical Physics and Computational Biology. Over the past 10 years I have spent a total of 18 months at universities in Germany and the United States, and I am currently a senior research associate at the Statistical and Biological Physics research group of the Hungarian Academy of Sciences in Budapest.
I think that the ICYS and the IYPT have contributed a lot to "infecting" me with the wish to pursue scientific research as a profession. The constant support of my parents and teachers has allowed me to make this wish come true.

My memories about the ICYS

Tibor Bukovinszky,
ICYS 1995, Baranavichi
Ecology section

This contest was my first experience that had anything to do with science. It was in the third year of my high school studies in 1993, when my biology teacher Dr. Gábor Szerényi asked me if I was interested in participating in the International Competition for Young Scientists, to be held next year in Baranavichi, Belorussia. So, it was with great anticipation on my side that, with the help of my teacher, I prepared a small study on the population ecology of a protected species of longhorn beetles (Semanotus russicus) inhabiting small remnant populations of juniper shrubs in Hungary. I was also glad as it was a great opportunity to travel abroad, and hopefully practice my English. We, the small group of delegate high school students and the supervisors, Dr. Zsuzsanna Rajkovits and Dr. Lajos Skrapits (both from the Loránd Eötvös University), left on an April morning and traveled by train to the contest. The trip took two days and was quite spectacular. Traveling through plains alternating with natural lowland forests of Ukraine and Belorussia, sporadically interspersed with small villages and orthodox churches with their bulbous golden domes.
The contest was organized in a youth camp situated in the forest outside Baranavichi. The most memorable to me were the interactions with other students of both Hungarian and other nationalities. I cannot recall exactly, there were about 4-5 nationalities in total, all from the former East-European block. Although I have participated later in other contests, this one left quite a unique impression on me. Having the freedom of addressing a biological problem from a different angle than that of a textbook, writing it up and discussing it in a foreign language, were all new experiences to me. This showed to a high school student that you can approach a problem from many different ways and doing research was probably great fun. It was in part due to this experience that I realized early on, why I would enjoy my job as an ecologist many years later. I strongly believe that having such experiences are essential for the future development of students. Kids need to realize very early, and independently, what goals they can achieve, and how exciting and fulfilling this can be. The best way to get started is participating in contests like ICYS that provide hands-on, problem-oriented experiences.

Dr. Tibor Bukovinszky Laboratory of Entomology, Wageningen University, PO Box 8031, 6700 EH Wageningen, The Netherlands (ed.)

International Conference of Young Scientists as I remember

Krisztián Buchta
ICYS 1997, ICYS 1998, ICYS 1999
Physics and Ecology sections

Many years passed since I have participated in the ICYS and performed my firs presentation as a secondary school student. But the conference has remained a nice memory for me.
Since the ICYS I have finished the university. I have participated in several seminars and conferences. Although the content of my presentations has become more complex, but the atmosphere of the conferences has not been much different from that I had experienced on the ICYS. Practically the preparation for the competition and the conference had been a small research project.
The participation in ICYS has not made me a better physicist and has not made my exams easier at the university, but it has helped to come to a decision about my profession.
Naturally, I like to remember the trip in Belarus, as well. I have seen an interesting foreign country and I have come to know a number of students in the conference. Some of them have become my classmates at the university and I also have worked one of them as a PhD student.
These are the reasons why I recommend to all inquisitive students to participate on the conference. I think this is the best chance to get insight to the world of academic conferences.
I wish all participants successful conference!

Krisztián Buchta is Ph.D. student of Eötvös University, Budapest, Hungary, field: solid state physics (ed.)

ICYS in our life

Beatrix Pollák
ICYS 2001, Katowice
Ecology section


Our story started in 2001 when the 8th ICYS was organized prominently by Urszula Woznikowska-Bezak and Beata Ryl with the help of many enthusiastic students in Palac Mlodziezy in Katowice, Poland. We will always remember this special competition.

The Hungarian team was selected and helped by Zsuzsa Rajkovits, founder of the conference, Lajos Skrapits, physics teacher and ***Péter Kenesei*** former participant of ICYS.

Péter took part first on the former competition in Minsk, Belarus, in 1993, which was an ancestor of the present ICYS. After this he enrolled to the Eötvös University in Budapest to be a physicist and become an organizer of the ICYS on the side of Zs. Rajkovits and L. Skrapits.

Peter really enjoyed the work with grammar school students on various exciting topics of natural sciences and learned a lot about organizing, especially in 1998, when the Conference was held in Hungary, and he was an organizer. Since 1998 he continued to help in the organization work and selecting the Hungarian team. He also constructed the central home page of the Conference, being used even today. Meantime he graduated in 2000 as a physicist, specialized in solid state physics and materials science, and carried on his studies as a PhD student in physics.

In 2001 I was a grammar school student in Baja, in the southern part of Hungary. Baja lies on the bank of the river Danube and neighbors the largest river-side forest of Hungary, Gemenc. I was a fellow of a naturalist and nature saving group which worked specially on saving the rare and endangered species of Gemenc. With their help and with the encouragement of my biology teacher Mária Mezeiné Kopasz, I made a small investigation on the spread of the shrubs of the Danube flood area with special interest to the rare and endangered Crataegus nigra (Hungarian Hawthorn). Reading about the Conference and its national selective part at the Eötvös University I decided to apply for it. Being selected to the Hungarian group I took part on the 8th ICYS with four other students (István Ballók, Árpád Drozdy, Babett Fodor and Krisztián Buza, three of them got also a prize at this Conference), and with our team leader, Péter.

The Conference was professionally organized with fluent sessions, expert jury and pleasant trips around Katowice. That was the first time in my life when I could try myself in an international medium, and I learned a lot about the scientific life and communication. I met many interesting people, and I was charmed by the beautiful historical and exciting places of Poland. I won double on the conference. I got the 3rd prize in the Ecology session, which enabled me to enter the Eötvös University without an entrance exam, and I got know Peter.

After the conference I started the Eötvös University as a student in biology. I graduated in 2006 as a biologist and specialized in microbiology. I wrote my theses on environmental bacteriology which is

the second love of my life. Péter finished his PhD and also graduated as a physics teacher. He took part on a materials science related European scientific project. In 2002 we married and today we have two small children (born in 2007 and 2008). And surely they will participate on ICYS in a few years! We are thankful for all of the organizers ICYS really changed our life forever.

ICYS in my life

Yuliia Pshenychka
ICYS 2003, 2004, 2006, 2007, 2008
Physics section

If I could describe ICYS with the only one word – I would say that ICYS is **Experience**. And this experience concerns all of the most important fields in our life: ICYS teaches us, young and inexperienced, how to make interesting and cognitive projects, how to investigate and describe unknown phenomena in the most favorite parts of science, how to present your achievements to people from different countries in the most attractive form, how to introduce your country at the international level, how to communicate with people and make new, really interesting and outstanding friends from all over the world, and many other important aspects of life. Due to this possibility I extended my focus of interests, learned and improved active English, made new friends and became acquainted with remarkable persons who play an enormously important role in science and political life.

ICYS showed me that there aren't any limits of growing up and achieving always new and new heights. Since I have an aim, I can work and improve myself in order to reach this goal. And if you have a chance to try something new and unexplored – do not leave it unattended and do not lose it. Maybe exactly this opportunity will show you the world that was concealed for you before. I changed my life and I wish you to make this step into the future too. ICYS – you're our inspirer. Dear organizers, I thank you very much for your hard work and successful creation named "ICYS".

Participation at ICYS, Projects:
23-29 April, 2003, Prague-Kladno. "Psychophysical Experiments", Physics.
18-24 April 2004, Nijmegen. "Oscillations in a Line of Unipolar Magnets", Physics.
18-23 April 2006, Stuttgart. "The Leyden Jar Investigation", Physics.
21-27 April 2007, St-Petersburg. "High Voltage Discharge in Graphite Dust", Physics. Bronze Medal
18-23 April 2008, Chernivtsi. "The Absolute Heat Exchanger", Physics. Bronze Medal

Yuliia Pshenichka is at the moment university student at Chernivtsi State University (ed.)

Memories

Marcell Takács
ICYS 2005, 2006, 2007
Physics and Ecology sections

ICYS, these four letters mean a lot of things for me. When in autumn 2004, I looked through the poster of this competition, I didn't know anything about it, but I found the idea of a student conference being interesting. So I wrote my short article about the asymmetry of amino acids. It wasn't a very serious and properly executed research, but it was my first scientific job. This time I was only 16 years old.

In February of 2005 my work was preselected and I was invited to present my results at the Eötvös Loránd University. Before my lecture I was very nervous, but at the end of the day I found myself among those five students who would represent Hungary at the international competition. In that year the ICYS was held in Katowice, Poland. That year the competition didn't bring me any prize, but on the other hand I gained a lot of experience, learnt how to present my subject in front of many people and an international jury and met other students from other countries. After the closing ceremony I decided that I would try it again in the next year.

As I promised in 2006 I returned with a new subject which was about those radioactive isotopes that can be found in the nature. This project was carried out much better than the previous one and it had significant results. Moreover I had practiced my English, so this time I found not so hard to become one of the five students from Hungary.

The competition in 2006 was the 13th ICYS and it took place in Stuttgart, Germany. I was already accustomed to the routine of the conference, so I was elected to the captain of the Hungarian team. The program wasn't as tight as in the last year so we had a lot of free time to walk in the city or to find new friends.

My lecture turned out to be a real success; however I didn't know it until the closing ceremony. The jury criticized some of my experimental data and I though that my presentation wasn't good enough to win. Fortunately only I saw the things so negative and finally I won the first prize.

The third and last time I participated at the conference in 2007, when the ICYS was held by Russia in Saint-Petersburg. I prepared my results again this time about the radioactive pollution from the Chernobyl accident around my home town Debrecen. I prepared my presentation and a chance was given again to compete in international forum. Well, I shall confess that this last time I didn't really mind that I didn't win instead I was satisfied that I experienced once more all those things that ICYS really means for me: travelling, seeing new countries, meeting new people, listening interesting lectures and experiencing a unique atmosphere.

The ICYSing Way of Science
A New Paradigm for the Future of Youth Science

Igor Ogashawara
ICYS 2005, 2006, 2007, 2008.
Ecology section

Although short-lived, the International Conference of Young Scientists has already carved its acronym in history amongst the greatest science competitions for youngsters ever designed due to two particular reasons: its unique method of evaluation, which successfully emulates aspects of a scientist's actual life, and its willingness to devote time for promoting an intercultural exchange between participants and hosts, highlighting the event's character to a much broader interpersonal concept than that of a mere science competition. Following this reasoning, I would say not only has the ICYS differed itself from other science events, but it has also created a new and better paradigm of quality-assessing the potential of young scientists who intend to become cutting-edge researchers, and I call this the ICYSing Way of Science.

During all these years, countless students have presented their ways of interpreting and redesigning previous interpretations of natural laws, applying theoretical concepts to our daily lives, building perspectives and paths to solutions yet to come, and the Conference has been amidst the responsible ones for enthusiastically showing them it is worth speaking up their minds about science at an early moment in their lives, sprinkling passion on their hearts and presenting an inquisitive thought to their knowledge-eager spirits. It has been about giving the first push, questioning their literacy for the first time, debuting the public interest in their conclusions with the utmost respect and formality they deserved. It has been about beginning. And every beginning has an end, and every end has a new beginning. That second beginning is what I believe the ICYS has been all about. That's the ICYSing Way of Science.

The influence of this Way of Science in the students' life is clear: as my country's representative since its first participation in Poland 2005, I am fully aware our students' professional choices (including my own) were directly affected by what was lived during the event. Many of them continued in the pursue of science, while others declared an interest in the area of communications was awakened after the experience of lecturing to an attentive and critical audience under severe evaluation. Even humanitarians have already been raised from the ICYS for believing they could take their ideals and projects to a new extent, a new level, causing change, being the change. Above all, this is the most important aspect of the Conference because humans pass on their experience through an ongoing process. In the same fashion these teenagers were influenced and stimulated during this one week occurrence, they carry on that enthusiasm for the rest of their lives and share it with friends, classmates, colleagues, teachers and family. This is the paradigm the ICYS is making anew and standardizing as a model to be followed. This is why it is worth trying.

I would like to congratulate all of those involved in the organizations of all editions of this noble event, and 15μ more years of expansion and success is my personal wish to the International Conference of Young Scientists! Congratulations!

Participants of the ICYS on the 40 years Anniversary of European Physical Society

Orsolya Pipek
Budapest, Hungary

By favor of the European Physical Society, with Máthé-Horváth Nóra and with two Polish students got the opportunity to visit CERN in Geneva, Switzerland. We were invited to attend a press conference that was held on the occasion of the 40th anniversary of the Society's establishment.

Nóra Máthé-Horváth and Orsolya Pipek with the Polish students

We got to spend three days in the beautiful, historic city of Geneva. Besides the wonderful sightseeing opportunities, on the 25th of September we were given the chance to listen to the very interesting seminar of Professor H. Chen. On the next day, we attended the press conference of EPS, where we could learn about both the history and the main goals of the society, as well as the importance of Physics in today's scientific researches. As all four of us have either competed in different kinds of Physics competitions, or are planning a future in Physics, it was extremely beneficial to have a look at further prospects in this field.

Once the press conference was over, we were shown around CERN by a young physicist. She was ready to give us full-detailed answers to all our questions, so it was an unforgettable experience for all of us. We were allowed to have a look around the ATLAS Control Room, and we also visited the Computer Centre. Our guide, Heidi Sandacker explained how the new LHC ring is supposed to work and what questions are hoped to be answered by the new methods. It was really amazing to see how precise organization and how many people those experiments need for being carried out accurately.

The whole institute is as large as a smaller town would be and it has its own streets, CERN vehicles and street signs. Physicists and university students from all over Europe are united between these walls to search for the answers of the oldest questions of our universe.

We are all greatly indebted to the European Physical Society for their financial support and kind invitation. Visiting CERN might have been a once in a lifetime experience for us, for which we are very grateful.

Students with the leaders of EPS

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