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# WorldGifted

Newsletter of The World Council for Gifted and Talented Children
www.world-gifted.org

## SelfDesign® - A New Way of Thinking about Learning

*The first six learners in the Wondertree program, on a Vancouver beach, with Brent Cameron (1984© Maureen Cameron)*

In our culture, the word "giftedness" implies a very special innate quality, realized by only a few. It suggests a metamorphosis or transformation from a special kind of nothingness to a powerful and elegant kind of everythingness, not excellence in everything but in a special area of focus in an individual's life. As a radical and innovative educator, I have chosen to look at this issue somewhat differently, believing that everyone has unique gifts to unfold. Because of the innovative nature of my work in human learning over the past forty years or more, I have had the opportunity to have breakthroughs in understanding and the possibility of extended observations into human learning.

**The origins of SelfDesign®**

On a beautiful sunny September morning in 1982, my daughter walked out of kindergarten. It was recess, and she was swinging joyfully on a swing. When the bell rang, she realized that she did not want to go back

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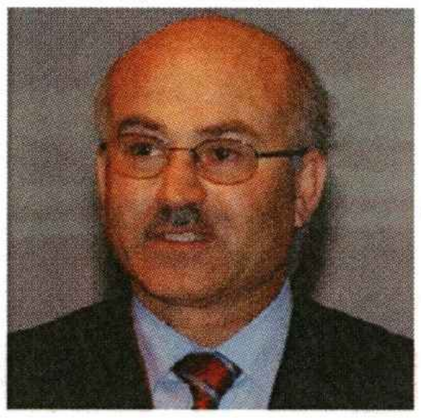

## A Message from the President

Taisir Subhi Yamin

The globalization of markets is characteristic of growing internationalization. International experience, combined with tolerance and openness for other cultures, is considered to be key for the future. Education enables people to make use of the opportunities of open borders and worldwide communication. Learning around the globe should be open to all people. The WCGTC is contributing by means of international cooperation.

The WCGTC will deal with significant issues on gifted education, as well as with gifted programming and initiatives aimed at promoting this field of knowledge. The manifold scholars and representatives of international institutions have a great opportunity to exchange views and knowledge and to discuss possibilities of cooperation. Many challenges await us, but also many opportunities. The first German Federal Chancellor, Konrad Adenauer, once said, "We all live under one sky, but we do not share the same horizon."

This international organization offers an excellent chance—through dynamic exchange and the establishment of international networks—to extend its horizon mutually. This not only creates progress for the people, but also peace and freedom for the world.

Investment in giftedness and talent development plays a major role in creativity and innovation. The question is then, "What makes certain countries more innovative and creative than others?"

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# International Young Physicists' Tournament

*Physicist, Ilya Martchenko pursuing a Ph.D. at the University of Fribourg, Switzerland*

Ilya Martchenko first became familiar with the Young Physicists' Tournaments in 1999 and has, since then, acted as a participant, team leader, advisor, juror, and problem contributor at many national and international YPTs. He also became a founding member of YPT-related POISK Centre at St. Petersburg State University, Russia, in 2004. Between 2005 and 2008, he presented a series of physics questions and demonstrations on Russian Channel 5. Having obtained a Master degree in St. Petersburg, he is now pursuing a Ph.D. at the University of Fribourg, Switzerland, working on condensed matter physics and nanotechnology. He combines his devotion to physics with professional interests in content-based, second-language acquisition and physics education.

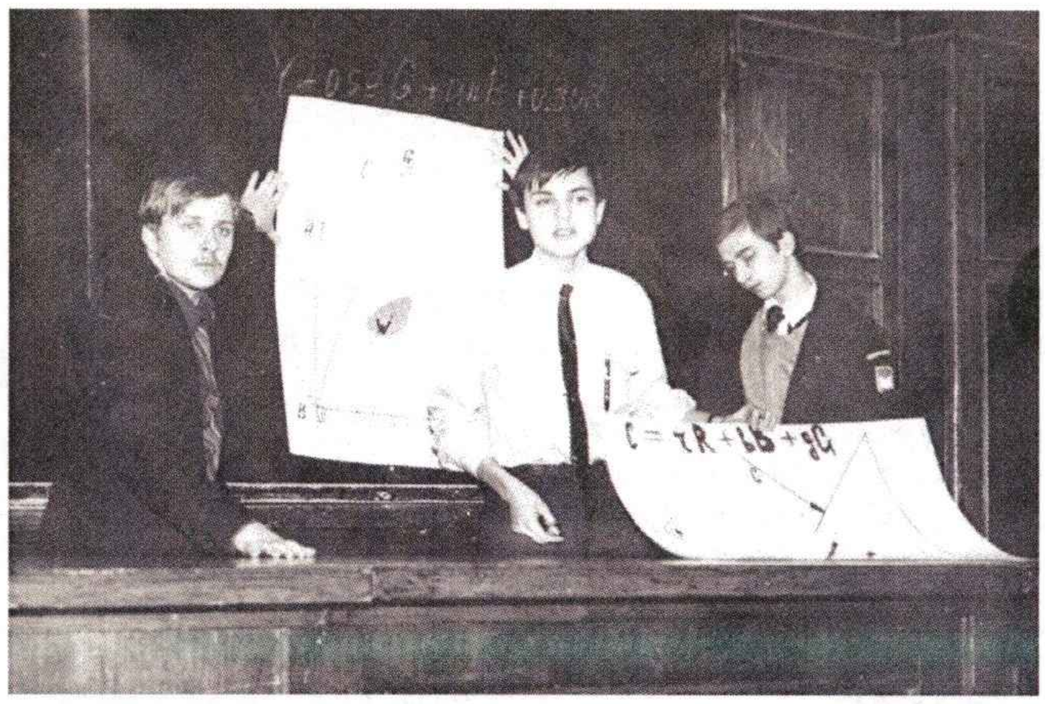
**Overview of the IYPT**

In 1979, a group of enthusiastic Soviet physicists, led by Evgeny Yunosov, initiated a small and unique competition: Young Physicists' Tournament (YPT.) Unlike earlier physics contests for secondary school students, the problems at YPT were research-oriented and encouraged participants to study some unusual and fascinating, every-day-life phenomena.

In 1988, the YPT attracted its first non-Soviet participants and, since then, it has grown from a Russian-language competition into one of the world's largest and most prestigious, international physics contests, with almost 30 nations competing annually.

*Evgeny Yunosov and a team captain from the Moscow School 47 during the first IYPT (1988)*

The tournament provides participants with an environment wherein they can perform valuable and independent scientific research without being required to find expensive equipment. Normally, there is almost a full year for the participants to investigate open-ended, non-examination tasks, form teams and, finally, defend the work before competitors and a panel of jurors.



*Participants from Moscow School 710 make a presentation in 1988 with visual aids typical of the time period*

The cornerstones of the competition have not changed significantly since the 1980s—interest-guided, informal learning; practice; teamwork; co-operation; and opportunities to establish contacts with professional physicists and other children who share a genuine interest in physics. In 2008, Evgeny Yunosov described the tournament in these words: ". . .I would say that the tournament is an action that produces an anomalously high concentration of talented people in a single location."

| IYPT when compared with 'real' research and problem-solving tests | | | |
|---|---|---|---|
| **Criterion** | **Tests and Examinations** | **"Real" Research in a Physics Lab** | **Young Physicists' Tournament** |
| General or special knowledge required? | Solid, well-structured, broad knowledge is required in certain areas of physics. | Time to learn everything is limited and an expert in aerodynamics is unlikely to require nuanced knowledge in quantum optics. | Problems focus on quite specific phenomena, and participants are implicitly taught to combine a general physics background with expertise in relatively narrow fields. |
| Start-to-finish solution or investigation? | Problems are formulated in detail with little choice to simplify, generalize, or re-formulate the problem. | The researcher needs to define and pose a specific and realistic problem and needs more experienced group-leader help. | The areas of research are suggested in the tasks, but participants and team leaders set goals, decide on the priorities, and the set the direction of the work. |
| Is there a "correct" answer? | The correct answer is known to organizers in advance. The choice of solution method is often limited. | The answer is never known in advance, and even its existence is uncertain. Some would argue that the term "answer" is irrelevant. | No predetermined answer to the problem exists. Participants learn to deal with the situation and find their own approach to open-ended tasks. |
| Is it possible to provide necessary results or solve the problems quickly? | Background concepts and theories are known and a skilled physicist is likely to get the answer in a matter of minutes. | Background knowledge is crucial, but a thoughtful, time-taking, experimental or theoretical analysis is necessary before the desired outcome is obtained. | Participants learn relevant physics and how to choose a strategy to obtain their own results. Much time is needed to complete projects up to a competitive level. |
| Learning to distinguish between one's own contribution and earlier work by others | Maximum scores are obtained if a participant reproduces a solution approach read earlier in a book. | Strong personal motivation to be familiar with the results of others; they quote earlier results correctly and never repeat earlier work. | May be expected to become a key aspect at IYPTs. Recently updated regulations encourage that. |
| Developing ideas through discussing current work with peers | No discussion of current results with competitors is expected. Such discussions are probably prohibited. | Many groups work in the same area on related problems. Researchers exchange ideas and results via papers and conferences, which benefits everyone. | Problems are the same for participants worldwide, but teams approach problems differently. May teach natural and mutually enriching exchange of ideas. |
| Peer review | Participants are highly motivated to find possible mistakes in their own solutions, but they feel confident that any mistake will be detected by the organizers in a very short time. | Every result is peer reviewed. Researchers feel personally responsible to cross-check results for possible drawbacks or mistakes and help others with the same. | Participants have the opportunity to receive feedback from teammates, leaders, jurors and competitors. IYPT motivates towards a critical approach and checking results. |
| How is the quality of results evaluated? | Grades depend on the number of problems having correct answers. | Number of references to publications and peer review. Detailed and general studies are valuable, as they contribute to knowledge in the field. | Participants are free to choose the aspects they study. Juror grades rely only on the project's relevance, consistency, and novelty, though the issue often remains questionable. |
| Scientific skepticism in evaluating relevance of own work and achievements of others | Tests effectively teach detecting mistakes and choosing best solution strategy, but possibly not interpreting the relevance and importance of the work done. | Strict personal responsibility not only to detect drawbacks or mistakes, but to optimize priorities, choose direction of the work, and evaluate outcome relevance critically. | Participants learn to choose problems they find interesting, effective, and relevant during all stages and can reject reporting some problems. Taking the floor as opponents and reviewers is key. |
| Learning to work with scientific literature and bibliography indexes | Preparatory work with literature is a key aspect of tests. Limited chances to learn surveying literature during problem solving. No handbooks or internet access is permitted. | Crucial aspect of the daily research | Participants learn to look for relevant information during the preparation and competition, striving to be critically conversant with the common knowledge in the field. |
| Learning foreign languages for professional communication | Opportunities to learn languages are not always visible. | An important aspect of the daily research. English is not the native language for a majority of researchers worldwide, and daily life in many labs is often multilingual. | IYPT and smaller competitions are held in English, giving a chance to learn professional English early. Other languages may be helpful at regional meetings. |
| Presentation techniques and skills to hold a discussion | Chances to learn are limited; little public speaking is expected. | Important for everyday research. | Public speaking and reasoning are key aspects that IYPT teaches in practice. |
| Teamwork skills | The competition is individual. | Almost all experimental physicists work in teams. | The IYPT is a competition for teams. |

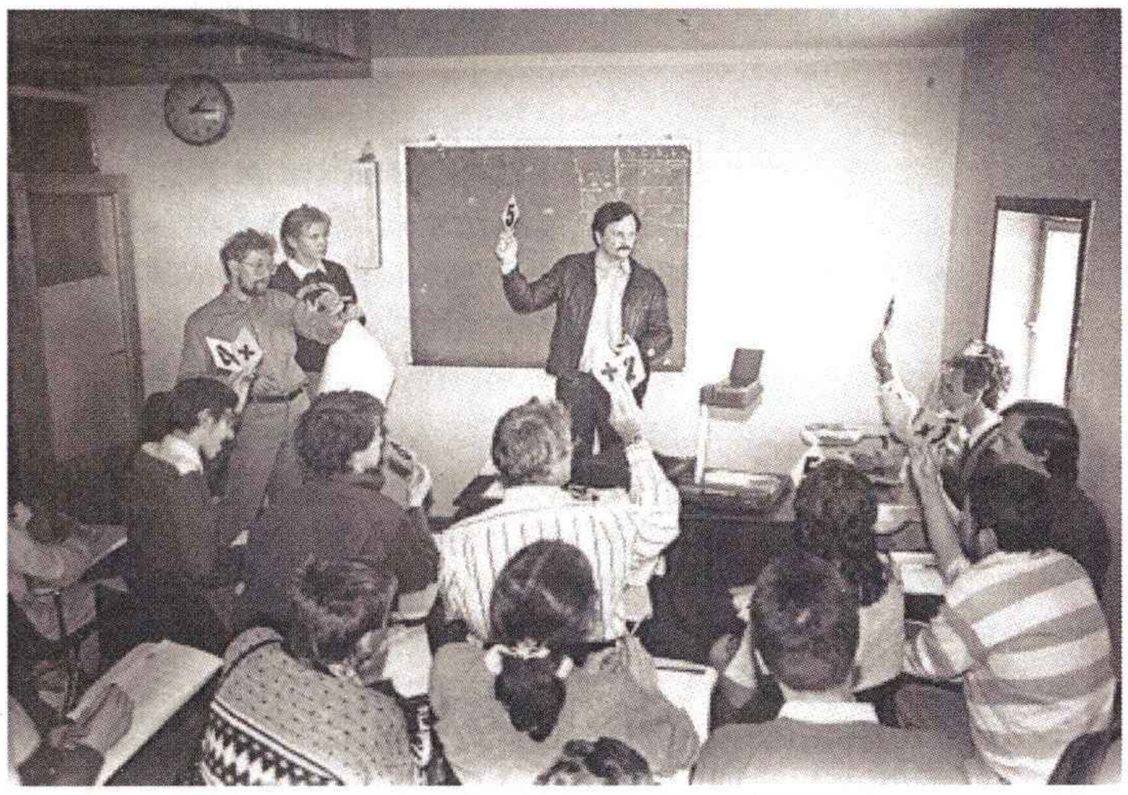
Note: Other areas of comparison, not shown in the above table, include Time management and deadlines, Novel results found, Learning new experimental techniques, and Learning to write scientific prose.

## Educational potential of the IYPT

The concept of the tournament became influential, and several countries initiated similar competitions for university undergraduates, who are, technically, forbidden to participate at the IYPT. One priority is to attract new nations where the competition is not yet established.

*The Dutch team at the third IYPT (1990), among the first active Western European participants, having joined in 1989*

The projects at IYPT are presented and defended at scientific discussions, historically called "Physics Fights." Such fights share much in common with science seminars, thesis defenses, or scientific conferences and are structured so that teams switch roles as reporters, opponents, and reviewers.



*A discussion-based Physics Fight at the third IYPT (1990), with jurors grading the performance of teams. Standing (left to right): International Organizing Committee member, M. Nikolaev; winning participant, Konstantin Yufryakov; and Physics Fight jury chair, Sergei Varlamov*

It is commonly agreed that the tournament is an effective opportunity for students to develop manifold expertise in physics, gain self-confidence and experience in public speaking, develop presentation techniques, and make acquaintance with other young people deeply interested in physics. Practice and communication contribute to personal, self-determined motivation. Such competencies may be important for life, not only for physics research. Several participants of early IYPTs became very successful in industry and business and credited their YPT background as good schooling, even calling it a "springboard".

The tournament may be considered complex in terms of implicitly teaching many competencies at once, from advanced math and physics to foreign languages, polemics, and goal setting skills. Developing such competencies is stimulated by the open, competitive atmosphere of the IYPT and the direct needs of a research project, rather than by formal, external training or instruction. Quite notably, a consensus exists that the highest possible standards are crucial to maintaining the keen enthusiasm of participants. The combination of these qualities makes possible the notable recognition that the tournament enjoys today.

## Gathering the IYPT history: You can help

In the rush of the growth of the competition, the opportunities for maintaining the archives of the earliest YPTs and IYPTs were sometimes neglected.

The considerable interest that the today's IYPT community has in the history of the competition has motivated the author and his colleagues to start investigating the details of early IYPTs and Soviet-based YPTs and locating original documents, proceedings, problems, results, and information on participants. Quite naturally, many of these materials were not written in English or in Russian, but in local languages of participants. (Documents in over ten languages are now on the list.)

As of 2010, our research priorities are

1. to trace, proofread, and translate the problems for 1979 - 1987 and 1988 - 1993 into English,
2. to locate information on teams and results in 1979 - 1987 and 1988 – 1993, and
3. to clarify how the regulations and the typical research projects of the Tournament evolved since 1979.

Plans exist to catalogue the growing archives online. Any contributions from the readers on early IYPTs are warmly welcomed.

## The 2010 IYPT

The 23rd tournament will be held in Vienna, Austria, from July 9 to July 16, 2010. Seventeen problems have been formulated for this tournament, including Electromagnetic cannon, Brilliant pattern, Steel balls, Soap film, Grid, Ice, Two flasks, Liquid light guide, Sticky water, Calm surface, Sand, Wet towels, Shrieking rod, Magnetic spring, Paper anemometer, Rotating spring, and Kelvin's dropper.

## Web links:

http://iypt.at is the page of the forthcoming 23rd IYPT

http://iypt.org is the central page of the competition

http://blog.ilyam.org and http://ilyam.org are the author's pages, with interviews and notes relating to the IYPT history.

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*University of Fribourg*
*in cooperation with C. Froese Klassen*