



## **Regulations of the International Olympiad on nanotechnologies**

### **“Nanotechnologies – Breakthrough to the Future!”**

#### **1. Aims of the competition**

The International Olympiad “Nanotechnologies – Breakthrough to the Future!” is an interdisciplinary competition organized for students at secondary and high school levels with the aim of attracting of interest of community to R&D in nanotechnologies and new materials. It is intended to stimulate the activities of students interested in chemistry by a way of the independent and creative solution of chemical, physical, mathematical and biological problems in materials science. The competitions help to facilitate cordial relations between young adults of different nationalities and encourage cooperation and international understanding of different generations of students, tutors and mentors.

#### **2. Organization of the Olympiad**

- 2.1. The Olympiad is organized every year beginning in the middle of November with the final results announcement by end of March.
- 2.2. The official web-site of the Olympiad is a portal of scientific information [www.nanometer.ru](http://www.nanometer.ru). All applicants should register for participation using the

official site of the Olympiad. None other web-site serves for the registration of participants.

- 2.3. Each competition has at least two stages: first one is an extramural (online or distant), and the second (final) stage is an intramural (traditionally organized at Lomonosov Moscow State University). Both stages include registration of participants, fixed time to solve problems with fixed deadline for all, appeal procedure, and publication of official stage results.
- 2.4. Duration of an online (distant) stage is about one or two months, usually from December 1<sup>st</sup> to January 31<sup>st</sup>. Results of the first stage are to be published by the middle of February.

The second step is an intramural individual competition for the best resulted participants of the distant stage. According to decisions of the Jury, the best competitors of the Olympiad could be suggested as winners in various nominations and being awarded by certificates and prizes by the Organization Committee.

- 2.5. Official results of the individual competition and a picture story from the Closing ceremony are expected to be published on the official web-site of the Olympiad.

### **3. Competitors**

- 3.1. The Olympiad is organized as a forum and assumes participation of different categories of competitors, such as secondary and high school students, young scientists, including BSc, MSc, and PhD students and post-docs, young naturalists 12+, tutors and mentors of school-age participants, science journalists or just enthusiasts of materials sciences and nanotechnologies.
- 3.2. Competitors must be Russian or English speaking since problems are proposed in these two languages.
- 3.3. Competitors should get an access to the Internet network to download texts of the problems and submit their solutions individually using their personal login and password.
- 3.4. To become a participant of the Olympiad applicant should register at the official web-side of the Olympiad, confirm his/her agreement for participation and his/her permission for publication of the minimum of his/her personal

information, including full name and family name, date of birth, sex, country and city in open statistics of the Olympiad.

#### **4. Problems on the Olympiad**

All problems proposed for competitors deal with nanotechnology, materials science and engineering. Most of the tasks are focused on the problems of nanomaterials, optics and photonics, medicine and biotechnology, energy efficiency, formation of coatings and modifying of surfaces.

The problems are assembled in four blocks – Biology, Chemistry, Mathematics, and Physics according to four corresponding school subjects – each block of 10 problems.

All problems should be proposed in both Russian and English languages to maximize the number of countries involved.

All problems of the online stage of the Olympiad are published at the official web-site of the Olympiad.

#### **5. Organizers**

5.1. The Olympiad is organized in bilateral cooperation of Lomonosov Moscow State University and Fund for Infrastructure and Educational Programs RUSNANO.

All the educational features of the Olympiad are provided by MSU Nanotechnology Educational Center, Department of Materials Science, Department of Chemistry, Department of Physics, Department of Biology of Lomonosov Moscow State University, as well as by representatives from a number of leading Russian universities and institutes of the Russian Academy of Sciences invited to join the Methodology Committee and the Jury council of the Olympiad. The Organizers decide on nominations and prizes for the competitors.

5.2. The Organizers provide:

- a. the itinerary of the Olympiad;
- b. that the organization of the competition will adhere to the regulations;
- c. the certificates and prizes, which are presented at the official closing ceremony;
- d. all necessary arrangements for the observance of safety regulations;
- e. accident insurance for all participants in connection with the itinerary.

## **6. Financing**

- 6.1. Organizers do not cover travel costs of the students and the accompanying persons to the designated airport/station or to the location where the competition is held.
- 6.2. No participation fee is assumed.
- 6.3. All costs incurred in the connection with the organized program, including the costs of accommodation in the nearest hostels of Lomonosov Moscow State University and participant package, are covered by Organizers. Standard participant package comprises a guide with the competition program, plan with marked key buildings of the Olympiad, a pen and a writing pad, participant badge as a pass to the key buildings during the competition.

## **7. Methodology Committee**

The members of the Methodology Committee of the Olympiad are authorized by Organizers. The committee consists of the chair, vice-chairs and members including specialists in interdisciplinary materials science, biochemistry, biophysics, physical chemistry, simulations, and engineering.

The Methodology Committee is responsible for:

- overall educational and examination program of the Olympiad.
- appeal procedure and final scores discussion,
- determine the winners according to final individual scores of the competitors.

Working languages of Jury are Russian and English. The members and the chair are obliged to maintain a professional discretion about any relevant information they receive during the Olympiad and must not assist any participants; they should keep the results secret until announced.

## **8. Responsibilities of the Jury**

- 8.1. The Olympiad Jury consists of its chair and members. The chair and the members of the Jury are nominated by the Organizer. The Jury includes

specialists in subjects of the Olympiad, namely, biology, chemistry, mathematics, physics in relation to nanomaterials and nanoengineering.

8.2. The Jury is in charge of the actual competition and its supervision according to the regulations. The chair of the Jury calls and chairs the meetings of the Jury concerning the current competition, correcting and marking. Working languages of Jury are Russian and English.

The Obligations of the Jury are:

- discuss in advance the competition tasks, their solutions and the marking guidelines, give comments in case if changes;
- monitor the examination and its adequacy to the Regulations, make decision on the exclusion of a participant from the competition;
- correcting and marking of the examination papers and guarantee that all participants are judged by equal criteria;
- participate in appeal procedure.

The Jury must not assist any participants and should keep the marking and the final scores secret until announced.

## **8. Supervisory Board**

The Supervisory Board of the Olympiad includes representatives of Russian research and business organizations playing the leading role in nanotechnology R&D and commercialization.

The Supervisory Board provides organizational oversight for the Olympiad. It is not empowered to make any decisions affecting the Olympiad results that would interfere with the duties of the Jury.

## **9. Extramural (online) stage of the Olympiad competition**

9.1. The online stage of the Olympiad requires a personal registration of each applicant at the official web-site of the Olympiad as a member of the Club of the Olympiad.

9.2. The deadline for the solution submission is January 31<sup>st</sup>. The deadline could not be changed for any participant even in case of any extenuating circumstances.

- 9.3. The number of the first stage participants invited as competitors for the second (final) stage are nominated by the Organizers.
- 9.4. All problems should be given in two languages – English and Russian – and be available to downloaded and read on the web-site of the Olympiad for competitors.
- 9.5. Organizers assist participants with registration and uploading processes if any technical problems take place.
- 9.6. Contact information of Organizers is to be available for participants.

## **10. Intramural (final) stage of the Olympiad competition**

- 10.1. Participants invited for the intramural (final) stage should carefully verify the accuracy of their personal information submitted including full names, date of birth, living country and city. After the registration for the final stage of the competition all changes of submitted personal information are excluded.
- 10.2. The registration of competitors performs by representative of the Organizers only. The registration is required for all participants independently on their age and home country.
- 10.3. The examination consists of four independent sessions which correspond to four blocks of the problems. The examination sessions are organized in two or three days consequentially. Time brakes between the sessions expected as lunchtime could not be less than one hour.
- 10.4. Each competitor is expected as a participant of four examination sessions of the Olympiad. If the participant does not intend to come for the session he/her should inform the Organizers before the beginning of the exam.
- 10.5. The safety regulations announced by the Organizers are binding for all participants.
- 10.6. The Olympiad is a personal competition. No cell phones or other electronic devices are authorized. A pocket calculator is allowed only for biology, chemistry and physics sessions, but not for mathematics.
- 10.7. The competitor is allowed to take a bottle of non-carbonated water to the examination room.

- 10.8. Number of points for each subparagraph of the task is given in branches in list with exam tasks.
- 10.9. Examination lists must not being signed anywhere by the competitor. After the session all solutions must be impersonalized and personalized only after the marking procedure. The personalization/impersonalization procedures have to be provided by the Organizers.

## **11. Correcting, Marking and Appeal**

- 11.1. Solutions of the competitors must be corrected and marked when they are impersonalized only. Organizers provide personalization of results after the Jury finished the marking.
- 11.2. The competition tasks are to be corrected independently by the Jury.
- 11.3. Each participant has a right to appeal to raise his/her points. The appeal is possible in one day, next one after the publication of the preliminary marking results, according to the Olympiad program.
- 11.4. After the appeal procedure discussion the final score for each participant is reaches and agreed by the Jury and the Methodology Committee.
- 11.5. The resulting score of the competitor is found as a sum of four scores – each one is for one block of the Olympiad.

## **12. Results and Prizes**

- 12.1. Official results of the competition and the number of honor nominations and certificates are decided by Organizers. The number of winners must not exceed 10 % of the number of final stage participants.
- 12.2. Traditionally, the first winner of the Olympiad is the competitor who has the maximum sum of two scores for online and final stages. The second winner is the competitor received the maximum score at the final stage.
- 12.3. Each participant of the final stage receives the certificate of participation.
- 12.4. In addition to the certificates other prizes may be awarded. The total number of awardees is up to 30 % of the final stage participants.

### **13. Final Remarks**

13.1. Those who take part in the competition acknowledge these regulations through their participation.

13.2. The regulations are valid since the 1<sup>st</sup> of December, 2015.