Unification 3

54th International Physics Olympiad, ISFAHAN, IRAN

23 July 2024 - 2 Mordad 1403

IRAN 54th International Physics Olympiad Isfahan Iran 2024

A GLOWING EVENT!

IPhO 2024 Isfahan, Iran

No. 3

SUMMARY OF THE DAY

The flame of IPhO2024 started glowing brightly and officially on the morning of July 22nd. The opening ceremonies started at 9 AM in the morning with the recitation of verses from Qur'an. Then the national anthem of the Islamic Republic of Iran was played and Dr. Meibodi went on the stage to welcome the guests. A special welcome video clip was shown, which included scenes from different meetings of various organizing committees, as well as pictures from the arrival and reception of the participants, leaders, and observers. After the video clip, the Education Minister of the Islamic Republic of Iran, Dr. Sahraei spoke to the guests. Dr. Bahmanabadi, Head of the Organizing Committee, spoke next. He explained the political pressures the organizers have faced for holding this Olympiad, and expressed his wish that one day, in light of the unification we seek in physics, the political borders will lose their significance.

A special cultural program planned for this opening ceremony was the traditional physical exercises recorded as Zoorkhanei rituals in the UNESCO list of the Intangible Cultural Heritage. Professor Rawat, Head of the International Physics Olympiad, delivered his speech and after that the procession of the participating teams started.

One of the important agenda of this day, was the discussion of the experimental exam problems, which started at 2 PM. During this session the team leaders are given the opportunity to discuss the problems with the designers of the problems and make suggestions. They then have to spend hours translating the problems for their students. Meanwhile, the students were divided in groups to take tours of the Scientific Research Township, the Science Museum, and the Handicrafts Exhibition of the Isfahan University of Technology.

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PERSIAN MUSIC

There is no tangible trace of the music of the earliest civilizations on the Iranian plateau, yet fragmentary historical documents point to a rich musical culture. The mythological king Jamshid is said to have invented music. Statues and bowls from the Parthian and Sasanian eras as well as a relief at ***Taq-e Buostan***, depict musicians playing their instruments. Many musicians have been recounted to belong to the court of Khosrow II, the most famous among them ***Barbad***. People have ascribed to him, the invention of lute as well as the musical tradition that through centuries has led to the current forms of ***dastgah*** and ***maqam***.

Lute player statue from the time of the Parthian Empire kept at the Netherlands Reijkmuseum van Oudheden.

Sasanian musical plate from the 7th century, kept at the British Museum.

Kayhan Kalhor a master of kamancheh.

Instruments of Persian Music.

During all this time, Persian music was preserved through an oral tradition, transferred from master to pupil. It was only in the early twentieth century that Ali-Naghi Vaziri (1886-1979), one of the first musicians trained in Europe, used western musical notation to write down Persian music. Another innovation of his was to introduce the concept of quarter-tone, by dividing each octave into 24 equal intervals, in order to accommodate the musical intervals customary in Persian music. His intention was to make possible the application of the western concepts of harmony in musical compositions within Persian modes.

His ideas have been criticized by Hormoz Farhat who has isolated five intervals with which all modes in Persian music can be constructed. According to him, the repertoire of classical Persian music is comprised of a body of ancient pieces, known collectively as the ***radif*** of Persian music. These are organized into twelve groupings, seven of which are called ***dastgah*** and five are considered to be derivative ***dastgah***s. Each of these ancient pieces are known as a gusheh with their own names. Each ***gusheh*** provides a modal and melodic framework within which the player improvises.

What has been described so far is the highly ornate music of professional urban musicians usually patronized by the nobility. The folk music of Iran is another story: the modal concepts of Persian folk music are directly linked with classical Persian music; however, improvisation plays a minor role, and the music has relatively clear-cut melodic and rhythmic properties. Yet, no definitive study of folk music has been carried out, considering the size of the population and the diversity of ethnic groups within it.

THE OPENING

CEREMONY

WHY AM I A PHYSICIST?

Prof. Niayesh Afshordi

Faculty at University of Waterloo and Associate Faculty at the Perimeter Institute for Theoretical Physic (PI)

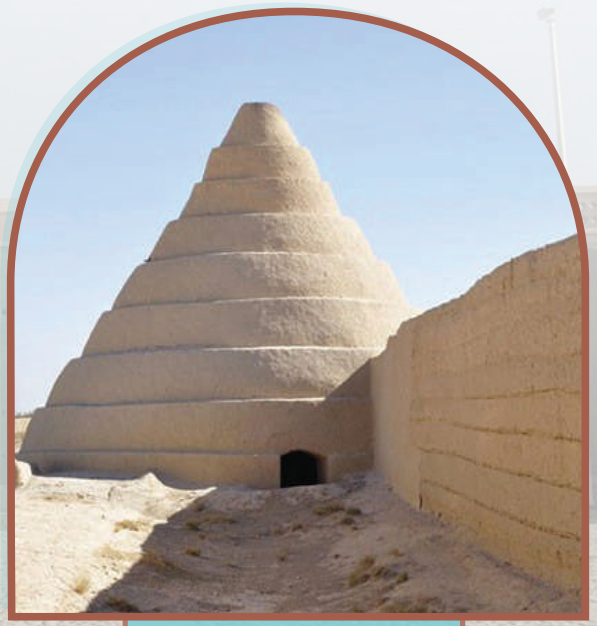
The answer may lie at the junction of curiosity, wonder, and a profound desire to understand the fabric of our universe. From a young age I was captivated by the night sky, the sheer expanse of the cosmos triggering questions that demanded answers. Stars, black holes, galaxies, mysteries that called me to explore beyond the visible horizon. Astrophysics, to me, is the most fundamental of sciences. It seeks to uncover the underlying principles governing everything from smallest subatomic particles to largest cosmic structures. A quest that is not merely academic, but deeply personal and spiritual. Every equation, every theory, every experiment is a step closer to unveiling the secrets of existence itself.

My journey as a physicist is driven by the thrill of discovery, the joy of solving puzzles that nature presents, and the profound nature of the questions we have to answer: What is the nature of dark matter and dark energy? How did the universe begin, what is its ultimate fate? What lies within black holes? These are not just scientific queries; they are glimpses into the very essence of reality. Being an astrophysicist allows me to contribute to a community that transcends borders and cultures. Science is a universal language, and through it, we break barriers and build bridges of understanding. I am an astrophysicist because I am compelled by the need to understand, to push the boundaries, and to share the wonders of the universe with others. It is a passion that fuels my life and defines my purpose.

Silver medal Winner, International Physics Olympiad held in Norway in 1996.

YAḴČĀL

YAḴČĀL (lit. "ice pit") and *YAḴDĀN* (lit. "ice container"), a building for storing blocks of ice which are collected in the winter for use in the summer. Until the 1960s, when mechanical, electrical- or kerosene-driven refrigeration became available in most of Iran, the yaḵčāl was one of the main features of Iranian vernacular architecture, reflecting adaptation to the dry conditions and extreme temperatures of the semi-arid climate of the Iranian plateau, in particular its scorching summer heat. Iranian ice-houses were facilities for the storage of solid ice, ensuring that ice was available for local distribution during the summer; they were not used for refrigerating foodstuff. Many yaḵčāl relied on shallow, open-air basins (*yaḵband*) for on-site ice production. During the frosty winter months, a thin layer of water, about 5-10 cm, was poured into the open-air basins, where it would freeze overnight. Beside the basins, tall walls were built to shield the ice layers from sunlight. The next day a second thin layer of water was poured atop the previous night's ice. This process was repeated until the ice in the basin had reached a height of about 50 cm. The thick layer of solid ice was chopped into blocks and brought inside the yaḵčāl for long-term storage. Afterwards the process began anew with pouring the first thin layer of water into the open-air basins. Some yaḵčāls were covered with high domes. During hot summer days, warm air, which is less dense, rises and exits through a skylight at the top of the dome, preventing the storage area from heating up. The yaḵčāl depended for its water supply on a system of underground irrigation canals (*qanāt*) and water reservoirs (*āb-anbār*). There were formerly, for example, more than 80 ice-houses in Tehran and more than 40 in Isfahan, and ice-making basins belonged to all of these. The most spectacular domed ice-houses can still be found in central Yazd province.



Abarquh yaḵčāl, Yazd Province

DID YOU LIKE THE OPENING CEREMONY?

Matsvei Valdouski | Belarus

The opening ceremony was beautiful and wonderful, one of the most memorable events in total, and a great beginning for our Olympiad. It gives us energy for the rest of the event.

Nurgeldi Annagurdov | Turkmenistan

I like Iranian customs, Iranian buildings and Iranian culture. I know about the past empires of Iran, the Seljuk empire, the Khwarazm empire, and I am happy to be here. The opening ceremony was very good.

Muhammad Adam Zachry Bin Mohd Ali | Malaysia

I feel the opening ceremony was really fun, because I got to meet a lot of different people, from many different countries, and on top of that former students from Iran, itself. The whole execution by the Iranian organization was really amazing especially compared to other competitions I have been to in the past. Last time we went to a European Physics Olympiad, I can safely say that the opening ceremony of the International Physics Olympiad here in Iran was much better the one in Georgia. I feel this shows how hardworking and how passionate the Iranians are about the International Physics Olympiad this year.

Juan Esteban Fonseca | Columbia

I liked the opening ceremony a lot, it was very fun. I really liked the sports exposition, I think the tricks and dances were very beautiful.

Rhythm Kedia | India

I quite enjoyed the opening ceremony, the performances were very nice, the speeches from the honorable speakers and all the guests were also very nice. It was quite enjoyable.

Yunish Thapaliya | Nepal

To just say the opening ceremony was good would be an understatement, the event was phenomenal. To experience such kind of event in person really paid off our hard work. The prayer to Allah had ourselves relaxed, the speech by esteemed individuals inspired us and boosted our confidence. To be able to see different colored flags from all around the globe and also one of it being ours really made us feel part of this glorious event, meeting new faces and exchanging thoughts with them enriched our experience.

"A man of the Polish persuasion got on a Boeing 767 for a routine flight back to the Motherland. He was getting comfortable in coach when a stewardess screamed out, 'The pilot and co-pilot are dead! Is there anyone left that can fly this aircraft?' The Polish man said, 'I was a pilot back in the war. Let me have a go at the controls.' So he bravely sauntered up to cockpit. When he opened the door, he was awestruck by the array of lights, dials, screens and switches in front of him, and he froze up. The stewardess shook him and said, 'Aren't you going to sit down and take the reins?' He said in a quavering voice, 'I'm just a simple Pole in a complex plane!'"

Who is right and why?

The air in the train has nonzero velocity. So, due to Bernoulli's law it has a smaller pressure and we should have an inward current through the window.

The air outside the train has nonzero velocity. So, due to Bernoulli's law it has a smaller pressure and we should have an outward current through the window.

scan me!

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Young Scholars Club