

Symmetry Festival

July 9-12, 2021
Sofia, Bulgaria

Symmetry in Nature and Society

The World's Largest Multidisciplinary Scientific & Art Festival in Symmetry Studies



Symmetry Festival venue
National Museum "Earth and Man"
Sofia, Bulgaria

This is final update on the scientific event. A hybrid type festival is suggested that combines a "live" in-person event with an online component.



Organized by the **SYMMETRION**, under the auspices of the **International Symmetry Association** (www.festival.symmetry.hu).

National organizers: National Museum “Earth and Man”; Bulgarian Mineralogical Society; Bulgarian Academy of Sciences (*Symmetry Festival* national coordinator: Ruslan I. Kostov, rikostov@yahoo.com).

Symmetry Festival 2021 Sofia (<http://festival.symmetry.hu>). Extended abstracts (up to 4 pages) to be published in the journal of Symmetrion – **Symmetry: Culture and Science** (for submission of abstracts see: <http://journal-scs.symmetry.hu/instructions-for-authors/>; copy to: rikostov@yahoo.com)

Program: International interdisciplinary scientific and art festival – including talks, presentations, workshops, art exhibitions, book shows, concerts, movies, performances and public events.



Worldwide symmetry events in the past:

Symmetry Festival 2016 Vienna; <http://festival.symmetry.hu/archive/symmetry-festival-2016/programs-2016/>

Symmetry Festival 2013 Delft; <http://festival.symmetry.hu/archive/symmetry-festival-2013/home-2013/organising-committee-and-program-committee-2013/>

Symmetry Festival 2009 Budapest; <http://festival.symmetry.hu/archive/symmetry-festival-2009/>

Symmetry Festival 2006 Budapest; <http://festival.symmetry.hu/archive/symmetry-festival-2006/>

Symmetry Festival 2003 Budapest; <http://festival.symmetry.hu/archive/symmetry-festival-2003/>

Symmetry Congress (organized by ISSS): 1998 Haifa; 1995 Washington D.C.; 1992 Hiroshima; Symmetry of Structure Symposium 1989 Budapest.

International Symmetry Association

| Executive Board | Honorary Members | Advisory Board | |
|--|--|--|--|
| <p>Gould, Laurence I. (USA): Chair</p> <p>Banney, David (Australia): CEO</p> <p>Bonch-Osmolovskaya, Tatiana (Australia - Russia)</p> <p>Fenyvesi, Kristóf (Finland - Hungary)</p> <p>Petitjean, Michel (France)</p> <p>Sugimoto, Takeshi (Japan)</p> <p>Honorary Chief Executive Officer</p> <p>Darvas, György (Hungary)</p> | <p>Kuroda, Reiko (Japan)</p> <p>Lalvani, Hareh (USA)</p> <p>Miyazaki, Koji (Japan)</p> <p>Rosen, Joe (Israel - USA)</p> <p>Shechtman, Dan (Israel; Nobel laureate)</p> <p>'t Hooft, Gerard (Netherlands; Nobel laureate)</p> <p>Weinberg, Steven (USA; Nobel laureate)</p> <p>Honorary President (deceased)</p> <p>Ne'eman, Yuval (Israel)</p> <p>Honorary Members (deceased)</p> <p>Burckhardt, Johann J. (Switzerland)</p> <p>Frolov, Konstantin V. (Russia)</p> <p>Hahn, Theo (Germany)</p> <p>Husimi, Kōji (Japan)</p> <p>Koptsik, Vladimir A. (Russia)</p> <p>Kroto, Harold (UK; Nobel laureate)</p> <p>Marcus, Solomon (Romania)</p> <p>Shinitzky, Meir (Israel)</p> | <p>Petoukhov, Sergey V. (Russia); Chair</p> <p>Aerts, Diederik (Belgium)</p> <p>Avnir, David (Israel)</p> <p>Beke, László (Hungary)</p> <p>Borovkov, Victor (Japan - Estonia)</p> <p>Caglioti, Giuseppe (Italy)</p> <p>Crowe, Donald (USA)</p> <p>D'Ambrosio, Ubiratan (Brasil)</p> <p>Dunham, Doug (USA)</p> <p>Elitzur, Avshalom (Israel)</p> <p>He, Matthew (China - USA)</p> <p>Hofkirchner, Wolfgang (Austria)</p> <p>Kappraff, Jay (USA)</p> <p>Kostov, Ruslan I. (Bulgaria)</p> <p>Mainzer, Klaus (Germany)</p> <p>Marijuán, Pedro C. (Spain)</p> | <p>Molnár, Emil (Hungary)</p> <p>Négadi, Tidjani (Algeria)</p> <p>Olovsson, Ivar (Sweden)</p> <p>Pardavi-Horvath, Martha (USA - Hungary)</p> <p>Pimenta, Emanuel Dimas de Melo (Portugal)</p> <p>Pollack, Gerald (USA)</p> <p>Ruffini, Remo (Italy)</p> <p>Schulte, Egon (USA)</p> <p>Séquin, Carlo (USA)</p> <p>Tennant, Raymond (UAE - USA)</p> <p>Verostko, Roman (USA)</p> <p>Vitiello, Giuseppe (Italy)</p> <p>Wegner, Bernd (Germany)</p> <p>Wysmuller, Tom (USA)</p> <p>Zee, Anthony (USA)</p> <p>Zenkin, Konstantin (Russia)</p> |

Keynote speakers for the Symmetry Festival 2021

Reiko Kuroda is a professor in Chemistry, Spectroscopy, X-ray Crystallography, Molecular Biology and Developmental Biology. She works in the Institute for Science and Technology Research, Chubu University. She is Professor Emeritus of the University of Tokyo and a member of the Royal Swedish Academy of Sciences.



Prof. **Haresh Lalvani** is a sculptor, inventor, architect, designer, morphologist and visual mathematician. He works at the Pratt Institute, New York. He is also affiliated with The Structural Morphology Group, the International Association of Shell and Space Structures, the Japan Institute of Hyperspace Science. He was awarded by the Graham Foundation for Advanced Studies in Fine Arts, the National Endowment for the Arts, and the National Institute for Architectural Education, and worked as an artist-in-residence at the Cathedral of St. John the Divine in New York and as the Co-Director of the Center for Experimental Structures at the School of Architecture, Pratt Institute. He is Honorary Member of the International Symmetry Association.



Prof. **Konstantin Zenkin** is a Russian pianist and theoretic of music. He is a Moscow P. I. Tchaikovsky Conservatory's vice rector for academic studies and an author of a number of books and articles about European music of the 19th-20th centuries, philosophy of music and piano performance art.



Prof. **Sergey Petoukhov** works in biophysics and bioinformatics. He is awarded with Soviet Union State prize (1986). He is head of the Laboratory of Biomechanical Systems of the Mechanical Engineering Research Institute of the Russian Academy of Sciences and a leading researcher at the Centre for Interdisciplinary Research in Musical Creativity of the Moscow State Conservatory. He is Chair of the Advisory Committee of the International Symmetry Association.





Symmetry Festival

9-12 July 2021, Sofia, Bulgaria

Symmetry in Nature and Society

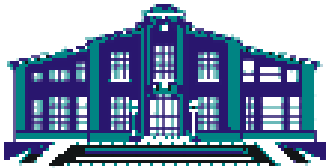
**The World's Largest Multidisciplinary Scientific &
Art Festival in Symmetry Studies**

National Museum "Earth and Man"
Sofia 2021

Organized by the
SYMMETRION
under the auspices of the
International Symmetry Association
(www.festival.symmetry.hu)



National Organizers



National Museum "Earth and Man"
Bulgarian Mineralogical Society
Bulgarian Academy of Sciences

National Organizing Committee

Prof. DSc. Ruslan I. Kostov (Chair); Prof. Dr. Hristo Smolenov;
Prof. Dr. Toni Chehlarova; Assoc. Prof. Dr. Radostina Atanassova;
Svetlana Encheva; Larisa Nesheva

Partners

National Gallery Sofia Arsenal – Museum of Contemporary Art
Credo Bonum Gallery
National Academy of Art
Pensoft Publishers

Symmetry Festival

PROGRAM: For online participants (introduction)

02.07.2021 10.00-11.00 (for online participants in Europe and Asia) and 17.00-18.00 (for online participants in USA)
Optional introductory Zoom meetings for testing system compatibility, internet connection and audio settings (Eastern European Summer Time Zone).

SYMMETRY FESTIVAL CONFERENCE AND ART PROGRAM

09.07.2021 09.00-10.00 Registration
10.00-10.30 Official opening of SF2021 (Central Hall)
10.30-12.30 Oral session (20+5 min.)

- **Darvas, György (Hungary)**. What is hypersymmetry? (online)
- **Smolenov, Hristo (Bulgaria)**. Ancient measures as codes in a creative space
- **Kuroda, Reiko (Japan)**. Cutting edge science reveals the secrets of chiro-morphogenesis in snails (online)
- **Miyazaki, Koji (Japan)**. Orthographic projections of hyperconics (online)
- **Petoukhov, Sergey V. (Russia)**. Symmetries, genetic languages and algebraic harmony in genomes

12.30-13.30 Lunch at the museum
13.30-15.30 Oral session (Art Hall; 12+3 min.)

- **Javorszky, Karl (Austria)**. Almost symmetrical subspaces resulting from sequencing natural numbers
- **Weil, Stephen (France)**. A timeline of symmetry 1800-2000 (online)
- **Petitjean, Michel (France)**. Chirality defined: The end of the even/odd paradigm (online)
- **Everitt, Dave, Fania Raczinski (United Kingdom)**. Magic square pattern homologies (online)
- **Gielis, Johan (Belgium), Simone Brasili (Italy)**. The apeirogon and dual numbers (online)
- **Chapman, Dominik (Switzerland), Johan Gielis (Belgium)**. Gielis transformations for the audiovisual geometry database (online)
- **Bakoev, Valentin (Bulgaria)**. On symmetry in mathematical identities
- **Koleva, Kamelia (Bulgaria)**. The beautiful symmetry of numbers

15.30-16.00 Coffee break

16.00-18.00 Oral/poster session (Art Hall; 12+3 min.)

- **Gould, Laurence I. (USA).** Reflections on similarity and symmetry in poetry & music (online)
- **Lalvani, Haresh (USA).** Pentiles: Discovery and concepts (online)
- **Fenyvesi, Kristóf (Finland).** Lalvani's pentiles tessellation system at experience workshop's educational events (online)
- **He, Matthew (USA).** Symmetry and asymmetry in bioinformatics: from genetic code to life (online)
- **Olsen, Scott (USA).** Golden proportional symmetry and the Divided Line: solving the Platonic puzzles in one fell swoop (online)
- **Dunham, Douglas, Lisa Shier (USA).** Creating symmetric art using craft technologies (online)
- **Dewar, Robert Earl (USA).** New members for the class of Penrose nonperiodic tilings of the plane (online)
- **Chen, Nina (USA).** Constructing harmony without a sound – Plato's Timeaus (online; poster)
- **Chen, Nina (USA).** The beauty of quantized form – Euclid's irrational lines in the construction of the Platonic solids (online; poster)

18.00-18.30 Conference Hall

- **Smolenov, Hristo (Bulgaria).** *The Auroolithic Varna Civilization* (29 min.; film on ancient measurements and proportions)

19.00 Welcome Party (Central Hall)

10.07.2021 10.00-12.15 Oral session (Art Hall, 12+3 min.)

- **Sugimoto, Takeshi (Japan).** The structure of the Solution Space in the direct and inverse Kepler problems (online)
- **Vladimirova, Genoveva (Bulgaria).** Relation between the Golden Ratio and colours
- **Gailiunas, Paul (United Kingdom).** Asymmetrical motifs in tooled book-bindings (online)
- **Protokhrystova, Cleo, Hristo Protohristov (Bulgaria).** Catoptric symmetries and asymmetries – cultural and scientific implications
- **Yavahchova, Mariya, Dimitar Tonev (Bulgaria).** Example for symmetry in nuclear physics
- **Erbudak, Mehmet (Switzerland/Turkey).** Symmetry of planar ornaments in Hellenic through Seljuk Ages (online)
- **Qureshi, Rabia Ahmed (Pakistan), Sarah Javed Shah (Pakistan), Gary J. Coates (USA).** The Baba Hasan Din Shrine by architect Kamil Khan Mumtaz as an archetype of deep symmetry in architecture (online)
- **Kostov, Ruslan I. (Bulgaria).** Symmetry patterns of images on megalithic T-shaped pillars from the prehistoric site Göbekli Tepe in Turkey
- **Spasova, Zdravka (Bulgaria).** Symmetry of stone tile flooring from the Temple Mount in Jerusalem, Israel

12.15-13.45 Lunch at the museum

13.45-15.00 Oral/poster session (12+3 min.)

- **Doncheva, Stella (Bulgaria).** The “Golden Section” in the Medieval Bulgarian architecture (online)
- **Vladimirova, Genoveva, Ognyan Dimitrov (Bulgaria).** The code of the Bulgarian embroidery script
- **Stefanides, Panagiotis (Greece).** Generator polyhedron geometry and relationships with Plato’s Timaeus and Epinomis (online)
- **Vlahov, Alexander (Bulgaria).** Information significance of the volume/surface ratio of the simple forms of the hexoctahedral crystallographic class (poster)
- **Atanassova, Radostina (Bulgaria).** Overview of the types of symmetry in the Bulgarian embroidery (poster)
- **Boeva, Julia (Bulgaria).** Types of symmetry in the embroidery from Sofia Region, Bulgaria (poster)
- **Stoilov, Dimitar, Genoveva Vladimirova (Bulgaria).** Innovative sports car design inspired by the model Manta (poster)

15.00-15.30 Coffee break

15.30-17.30 Symmetry and Music (12+3 min.)

- **Zenkin, Konstantin V. (Russia).** Symmetry as a carrier and keeper of musical information
- **Petoukhov, Sergey, Elena Petoukhova, Vitaly Svirin, Vladimir Verevkin (Russia).** Symmetries, the genetic basis of organisms and musical harmony
- **Rovenko, Elena (Russia).** Translatory symmetry as a constructive basis of the “cyclic principle” in music and architecture in interpretation of Vincent d’Indy
- **Stanishevskiy, Yaroslav (Russia).** Harmonic organization in music: symmetry or asymmetry?
- **Gaulhiac, Manuel (France).** Symmetry of resonance in Almeida Prado’s *Cartas Celestas I*
- **Koblyakov, Alexander A. (Russia).** Symmetry in the context of transdimensional relations (online)
- **Stepanyan, Ivan V. (Russia).** The geometrical concept (online)

18.00-19.15 Concert (Central Hall)

- **Zenkin, Konstantin V. (Russia).**
Piano concert (program): Mozart, Haydn, Chopin, Liszt, Scriabin, Prokofiev
- **Bekirska, Boryana (Bulgaria).**
Viola concert (program): *Music that Brings You to Different Dimensions and Densities:* Einaudi, Djavadi, Gundry, Pallett, Britell, Van Dormael

20.00 Official Dinner (Restaurant “Hemus”)

11.07.2021 10.00-11.00 Symmetry in Education and Computer Applications (Art Hall; 12+3 min.)

- **Chehlarova, Toni (Bulgaria).** Game with center of central symmetry in the plane
- **Chehlarova, Neda, Toni Chehlarova (Bulgaria).** Computer model for self-preparation for playing with dominoes “Axes of Symmetry”
- **Chehlarova, Toni, Mladen Valkov (Bulgaria).** Game with vertical axis of symmetry in a rectangular board
- **Jones, Kate (USA).** Sweet symmetries: A gallery of gamepuzzles – “math as art” (online)

11.00-11.30 Closing of the Scientific Program

- **Smolenov, Hristo (Bulgaria).** *Codes in Space* (27 min.; film on ancient measurements and proportions)

11.00-17.00 “Family Day” (Central Hall)

Symmetry: Crystals, geometry and more... structures, puzzles and games for children, students and curious adults

- Children’s corner with crystals and mineral games
- Symmetry in crystals and other solids
- Mosaics, games and puzzles
- Sacred geometry
- The graphic art of M. C. Escher

14.00-15.00 ISA General Assembly (Art Hall)

12.07.2021 09.00-17.00 Excursion to the Rila Monastery

Harmony between architecture and natural scenery

The Rila Monastery is the largest and most famous Eastern Orthodox monastery in Bulgaria. It was founded in the 10th century by the heavenly protector of the Bulgarians Saint John of Rila after the official adoption of the Christian religion in Bulgaria in 865. During the centuries the monastery was destroyed and abandoned several times. The monastery and its church were rebuilt in the beginning of the 19th century. It became a center of spiritual and cultural life during the Bulgarian National Revival Period. The Hrelyu’s tower is the oldest preserved monument dating from 1335. The main church is decorated with mural paintings and exquisite wood carvings by the best representative of the Samokov, Debar and Bansko-Razlog schools. Since 1983 the Rila Monastery is listed as [UNESCO World Heritage Site](#).

ART AND CULTURAL EVENTS

9-12.07.2021

Special Exhibitions at the National Museum “Earth and Man”

Crystals shine with their symmetry! (“Course in Crystallography”, 1891)

E. S. Fedorov (1853-1919)

- Symmetry in Crystallography and Mineralogy (1 floor; left)
- Minerals in Contemporary Literature (1 floor; left)
- Minerals and Gemstones on Stamps (1 floor; right)
- Poetry and Gemstones (2 floor; right)
- Photo Gallery: Bulgarian Minerals (2 floor; right)
- “Secrets of Earth”: natural forms as personal vision for future innovative professional activity (watercolors of students from the National Academy of Art) (1 floor)
- Prehistoric Treasures, the Golden Ratio and Units for Measurement: First Gold of Mankind; First Copper Mines in Europe; Standardization of Mineral, Gemstone and Metallic Artifacts (posters; 1 floor; entrance)

Festival Art Exhibitions

- At the National Museum “Earth and Man” (Central Hall)
Chehlarova, Koya (Bulgaria). Glassworks “*Planet Cuboctahedron*” (Central Hall, right)
Michailov, Hristo (Bulgaria). Sculptures (bronze, crystal) “*Symmetry*” (Central Hall, right)
Mircheva, Svetlana (Bulgaria). “*Palm Trees*” (Central Hall, right)
Stoilov, Dimitar, Genoveva Vladimirova (Bulgaria). Design “*Manta*” Model (Central Hall, right)
- At the National Gallery Sofia Arsenal – Museum of Contemporary Art (next door)
Mircheva, Svetlana (Bulgaria). “*Possible Exhibitions*”

Important deadlines

- **March 12, 2021** Open online Festival registration and submission of abstracts.
- **May 10, 2021** Deadline for abstract submission and regular registration.
- **July 9-12, 2021** Opening of Symmetry Festival 2021; Festival sessions and other events.

General information

Presentation type. One or two extended abstracts (each up to 4 pages with references) by a single author and/or first co-author may be submitted as oral and/or poster presentation(s). All oral presentations (30 min. plenary; 15 min. normal) will be made using computers provided by the organizers. For your poster presentations, please print your posters in max. size A0 (ca. 119 x 84 cm; portrait orientation) or smaller. Your abstract(s) will not be published until your registration fee is received. By submitting an abstract, the author(s) attest that the abstract submitted has not been previously published elsewhere and transfers, or otherwise conveys the copyright for its publication.

For online participants: 1 – live online participation in Zoom sessions; 2 – pre-recorded video participation (sent in advance); 3 – electronic participation with a poster, which will be included in the correspondent online poster session (sent in advance).

Sofia Sightseeing and Museums

National History Museum; National Institute of Archaeology with Museum; National Museum of History; Boyana Church (UNESCO site); St. Alexander Nevsky Cathedral Crypt Icon Museum; Sofia History Museum; National Museum of Military History; National Polytechnical Museum; National Anthropological Museum; Kvadrat 500 (International and National Art Museum); Museum of Socialist Art; Sofia Arsenal Museum for Contemporary Art; Art Galleries.

Festival venue

The Symmetry Festival 2021 will take place at the **National Museum “Earth and Man”**; Bulgaria, Sofia 1421, Blvd. Cherni Vrah 4. E-mail: earth.and.man@gmail.com; office@earthandman.org; http://www.earthandman.org/?page_id=951&lang=bg.

The registration desk at the National Museum “Earth and Man” will be open during the following hours on July 9-10, 2021: 9.00-15.00 h.