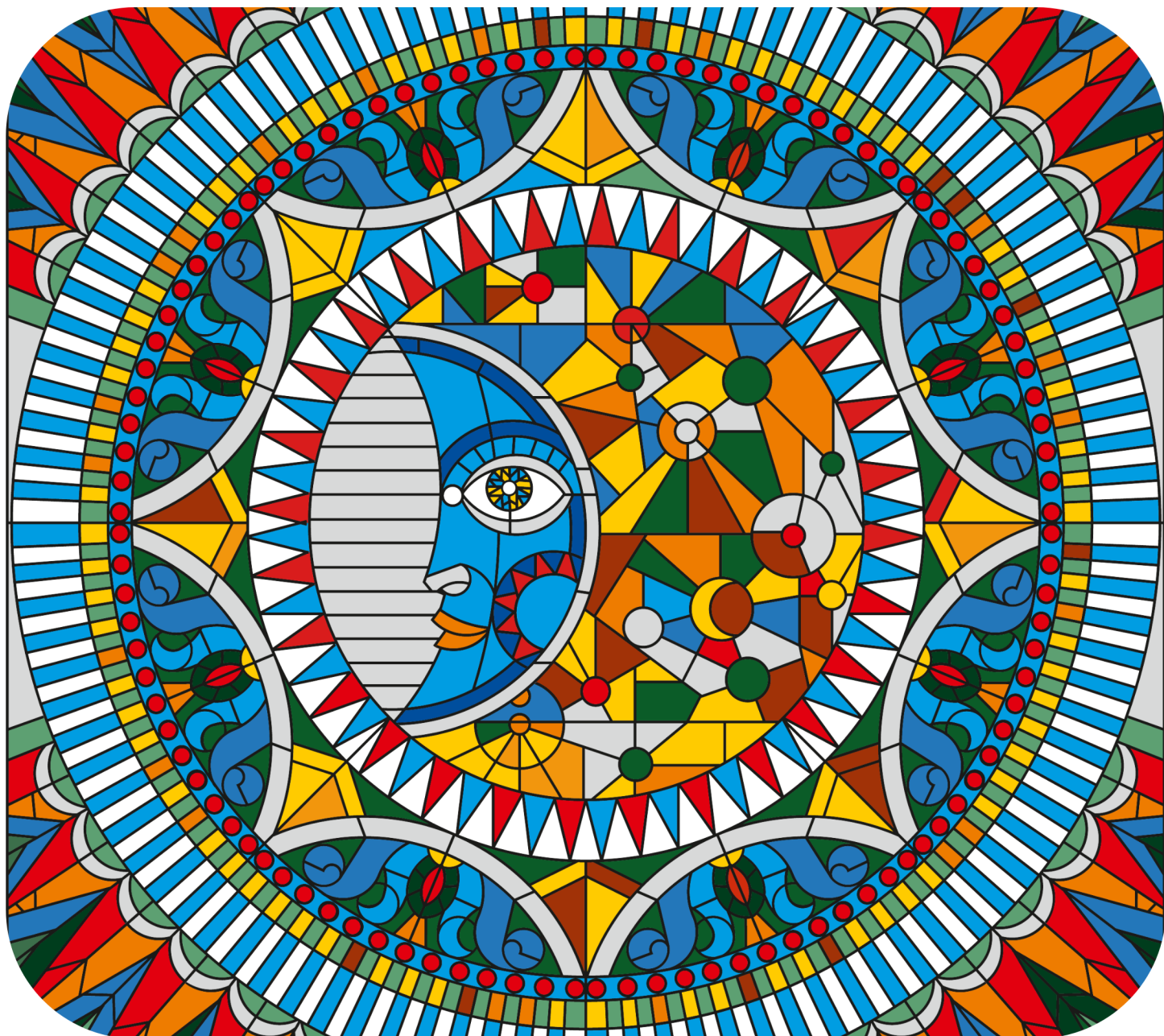




International Conference and PhD-Master Summer School

Groups and Graphs, Algebras and Applications

Book of abstracts

August 3-17, 2025
Novosibirsk, Russia

Mathematical Center in Akademgorodok
Novosibirsk State University
Sobolev Institute of Mathematics

Groups and Graphs, Algebras and Applications

3 – 17 August, 2025

Book of abstracts



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The book contains abstracts of all talks of G2A2-participants on groups, graphs, algebras and applications including minicourses descriptions. Main topics of the abstracts are new results in group theory, axial algebras, algebraic combinatorics, spectral graph theory, coding theory.

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Contents

General Information	4
Conference Program	5
Minicourses	15
Keynote Talks	20
Plenary Talks	44
Contributed Talks	55
List of Participants	82
The G2-series	84

General Information

This is the tenth event of the G2-series of International Conferences and Summer Schools. Since 2014, the G2-events were held in Russia, China, and Slovenia as satellite events of the 8th ECM.

Venue:

All scientific activities take place at Novosibirsk State University, August 3–17, 2025. The Novosibirsk State University (NSU) is a part of the scientific centre Akademgorodok, which is located in about 30 km south of the city center of Novosibirsk. For more information, see <https://en.wikipedia.org/wiki/Akademgorodok> and see https://en.wikipedia.org/wiki/Novosibirsk_State_University.

The main goal: G2A2-2025 aims to bring together experts, young researchers and students from different fields of mathematics and their applications mainly based on algebra and group theory, geometry and algebraic graph theory, topology and algebraic combinatorics, coding theory and theory of computational complexity, especially those involving group actions on combinatorial objects.

Language: The official language of the event is English.

Program: The program includes 50-minute plenary talks, 25-minute contributed talks and minicourses.

Organizers:

Nikolay Abrosimov, Sobolev Institute of Mathematics, Russia

Elena V. Konstantinova, Mathematical Center in Akademgorodok, Sobolev Institute of Mathematics, Novosibirsk State University, Russia & Three Gorges Mathematical Research Center, China Three Gorges University, China

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Alexey Zakharov, Mathematical Center in Akademgorodok, Sobolev Institute of Mathematics, Novosibirsk State University, Russia

Organized by:

The G2A2-2025 is organized by the Mathematical Center in Akademgorodok, Novosibirsk State University and Sobolev Institute of Mathematics. It is supported by the Mathematical Center in Akademgorodok under the agreement No. 075-15-2025-348 with the Ministry of Science and Higher Education of the Russian Federation.

In Collaboration with:

Sino-Russian Mathematics Center at Peking University (Beijing)

Three Gorges Mathematical Research Center at China Three Gorges University (Yichang)

Website:

<https://mca.nsu.ru/g2a2-2025/>

Enjoy the Art of Mathematics with us!



Conference Program

Sunday, August 3

- 18:00 - 19:00 Registration
 19:00 - 21:00 Welcome party

Monday, August 4

- 07:30 - 09:45 Breakfast
 09:45 - 10:00 **Opening**
Minicourse 1
Chair: Alexander Gavrilyuk
 10:00 - 10:50 Ilia Ponomarenko & Andrey Vasil'ev: *Lecture 1*
 11:00 - 11:50 Ilia Ponomarenko & Andrey Vasil'ev: *Lecture 2*
 11:50 - 12:10 Coffee break
Minicourse 2
Chair: Ilya Gorshkov
 12:10 - 13:00 Sergey Shpectorov: *Lecture 1*
 13:00 - 14:50 Lunch
 14:50 - 15:40 Sergey Shpectorov: *Lecture 2*
 15:40 - 16:00 Coffee break
Plenary talks
Chair: Andrey Mamontov
 16:00 - 16:50 Natalia Maslova: *Gruenberg–Kegel graph, graphs defined on groups, and graphs with regularity conditions*
 17:00 - 17:50 Saveliy Skresanov: *Growth of subsets in finite simple groups*
 17:50 - 18:10 Coffee break
Contributed talks
Chair: Andrey Mamontov
 18:10 - 18:35 Alexandr Panasenkov: *Decompositions of octonions into a sum of two subalgebras*
 18:35 - 19:00 Luka Nikiforov: *Prefix reversal triples that generate the symmetric group*
 19:00 - 20:00 Dinner
 20:00 - 22:00 **Problem solving: Minicourse 1**
Chair: Saveliy Skresanov

Tuesday, August 5

- 07:30 - 09:45 Breakfast
Minicourse 1
Chair: Alexander Gavril'yuk
- 10:00 - 10:50 Ilia Ponomarenko & Andrey Vasil'ev: *Lecture 3*
11:00 - 11:50 Ilia Ponomarenko & Andrey Vasil'ev: *Lecture 4*
11:50 - 12:10 Coffee break
Minicourse 2
Chair: Alexander A. Ivanov
- 12:10 - 13:00 Sergey Shpectorov: *Lecture 3*
13:00 - 14:50 Lunch
14:50 - 15:40 Sergey Shpectorov: *Lecture 4*
15:40 - 16:00 Coffee break
Plenary talks
Chair: Natalia Maslova
- 16:00 - 16:50 Timur Nasybullov: *On connections between the additive and multiplicative groups of a skew brace*
17:00 - 17:50 Maria Grechkoseeva: *Element orders in graph extensions of finite simple exceptional groups*
17:50 - 18:10 Coffee break
Contributed talks
Chair: Natalia Maslova
- 18:10 - 18:35 Wei Zhou: *On groups with the same set of conjugacy class sizes as nilpotent groups*
18:35 - 19:00 Dmitri Drozdov: *Building self-similar forests*
19:00 - 20:00 Dinner
20:00 - 22:00 **Problem solving: Minicourse 2**
Chair: Ilya Gorshkov

Wednesday, August 6

- 07:30 - 09:45 Breakfast
Keynote Talks
Chair: Vladimir Trofimov
- 10:00 - 10:50 Alexander Ivanov: *The simple connectedness of the 2-local geometry of the Higman–Sims group*
- 11:00 - 11:50 Ilya Gorshkov: *Axial algebras, graphs and their automorphism groups*
- 11:50 - 12:10 Coffee break
Keynote Talks
Chair: Vsevolod Gubarev
- 12:10 - 13:00 Alexey Staroletov: *On eigenvalues of permutations in irreducible representations of symmetric and alternating groups*
- 13:00 - 14:50 Lunch
- 14:50 - 15:40 Pavel Kolesnikov: *On the Dong property for binary quadratic operad*
- 15:40 - 16:00 Coffee break
Keynote talks
Chair: Alexander A. Ivanov
- 16:00 - 16:50 Vladimir Trofimov: *Eigenvalues and eigenfunctions of locally finite graphs-I*
- 17:00 - 17:50 Vladimir Trofimov: *Eigenvalues and eigenfunctions of locally finite graphs-II*
- 17:50 - 18:10 Coffee break
Keynote talks
Chair: Alexander Mednykh
- 18:10 - 19:00 George B. Shabat: *Dessins d'enfants related to some remarkable groups and algebras*
- 19:00 - 20:00 Dinner
- 20:00 - 21:00 Social events: *Tour to the NSU Dome*

Thursday, August 7

- 07:30 - 09:45 Breakfast
Minicourse 1
Chair: Alexander Gavriluk
- 10:00 - 10:50 Ilia Ponomarenko & Andrey Vasil'ev: *Lecture 5*
 11:00 - 11:50 Ilia Ponomarenko & Andrey Vasil'ev: *Lecture 6*
 11:50 - 12:10 Coffee break
Minicourse 2
Chair: Alexander A. Ivanov
- 12:10 - 13:00 Sergey Shpectorov: *Lecture 5*
 13:00 - 14:50 Lunch
 14:50 - 15:40 Sergey Shpectorov: *Lecture 6*
 15:40 - 16:00 Coffee break
Plenary talks
Chair: George B. Shabat
- 16:00 - 16:50 Vsevolod Gubarev: *Rota–Baxter operators on a sum of fields and rooted 2-colored trees*
 17:00 - 17:50 Valery Bardakov: *Rota–Baxter operators on groups, racks, algebras, and Yang–Baxter equation*
 17:50 - 18:10 Coffee break
Contributed talks
Chair: George B. Shabat
- 18:10 - 18:35 Ivan Yudin: *On the orders of points of a self-similar dendrite with finite boundary*
 18:35 - 19:00 Haofang Sun: *Tiling of the sphere by congruent curvilinear quadrilaterals*
 19:00 - 20:00 Dinner
 20:00 - 22:00 **Problem solving: Minicourse 1**
Chair: Saveliy Skresanov

Friday, August 8

- 07:30 - 09:45 Breakfast
Minicourse 1
Chair: Alexander Gavril'yuk
- 10:00 - 10:50 Ilia Ponomarenko & Andrey Vasil'ev: *Lecture 7*
 11:00 - 11:50 Ilia Ponomarenko & Andrey Vasil'ev: *Lecture 8*
 11:50 - 12:10 Coffee break
Minicourse 2
Chair: Alexander A. Ivanov
- 12:10 - 13:00 Sergey Shpectorov: *Lecture 7*
 13:00 - 14:50 Lunch
 14:50 - 15:40 Sergey Shpectorov: *Lecture 8*
 15:40 - 16:00 Coffee break
Plenary talks
Chair: Min Yan
- 16:00 - 16:50 Alexander Mednykh: *Homology group of branched coverings of knots and Jacobians of graphs*
 17:00 - 17:50 Nikolay Abrosimov: *Geometry of knots: from representation of the fundamental group to the volume formula*
 17:50 - 18:10 Coffee break
Contributed talks
Chair: Min Yan
- 18:10 - 18:35 Ilya Mednykh: *Characteristic polynomial of Laplacian matrix for circulant foliations*
 18:35 - 19:00 Galina Sokolova: *Characteristic polynomial of the Laplacian of a circulant graph with non-fixed jumps*
 19:00 - 20:00 Dinner
 20:00 - 22:00 **Problem solving: Minicourse 2**
Chair: Ilya Gorshkov

Saturday, August 9

- 07:30 - 09:45 Breakfast
Keynote Talks
Chair: Pavel Kolesnikov
- 10:00 - 10:50 Shaofei Du: *Decomposition of Groups and Cayley Maps*
 11:00 - 11:50 Huye Chen: *On the Burness–Giudici conjecture for the Lie type simple groups of rank one*
 11:50 - 12:10 Coffee break
Keynote Talks
Chair: Vsevolod Gubarev
- 12:10 - 13:00 Grigory Ryabov: *Cayley graphs with regularity conditions from difference sets*
 13:00 - 14:50 Lunch
 14:50 - 15:40 Min Yan: *Vertex type and angle congruent tiling*
 15:40 - 16:00 Coffee break
Special Session
Chair: Elena V. Konstantinova
- 16:00 - 16:50 *G2X2*
 17:00 - 17:30 Social events: *Conference Photos*
 19:00 - 22:00 Social events: *Conference Dinner*

Sunday, August 10

- 10:00 - 11:30 Social events: *Tour to the NSU Earth history museum guided in English*
 11:30 - 12:00 Social events: *Visiting a museum souvenir shop*

Monday, August 11

07:30 - 09:45	Breakfast
	Minicourse 3
	<i>Chair: Shaofei Du</i>
10:00 - 10:50	Tao Feng: <i>Lecture 1</i>
11:00 - 11:50	Tao Feng: <i>Lecture 2</i>
11:50 - 12:10	Coffee break
	Minicourse 4
	<i>Chair: Denis Krotov</i>
12:10 - 13:00	Grigory Kabatyansky: <i>Lecture 1</i>
13:00 - 14:50	Lunch
14:50 - 15:40	Grigory Kabatyansky: <i>Lecture 2</i>
15:40 - 16:00	Coffee break
	Plenary talks
	<i>Chair: Ivan Mogilnykh</i>
16:00 - 16:50	Denis Krotov: <i>Completely regular codes in graphs covered by a Hamming graph</i>
17:00 - 17:50	Vladimir Potapov: <i>Relations between error-correcting codes and cryptographic functions</i>
17:50 - 18:10	Coffee break
	Contributed talks
	<i>Chair: Ivan Mogilnykh</i>
18:10 - 18:35	Shikang Yu: <i>Orthomorphisms and complete mappings of groups</i>
18:35 - 19:00	Anna Taranenko: <i>On cuboctahedrons in latin squares and hypercubes</i>
19:00 - 20:00	Dinner
20:00 - 22:00	Problem solving: Minicourse 3
	<i>Chair: Shikang Yu</i>

Monday, August 12

07:30 - 09:45	Breakfast
	Minicourse 3
	<i>Chair: Shaofei Du</i>
10:00 - 10:50	Tao Feng: <i>Lecture 3</i>
11:00 - 11:50	Tao Feng: <i>Lecture 4</i>
11:50 - 12:10	Coffee break
	Minicourse 4
	<i>Chair: Denis Krotov</i>
12:10 - 13:00	Grigory Kabatyansky: <i>Lecture 3</i>
13:00 - 14:50	Lunch
14:50 - 15:40	Grigory Kabatyansky: <i>Lecture 4</i>
15:40 - 16:00	Coffee break
	Plenary talks
	<i>Chair: Tao Feng, BJTU</i>
16:00 - 16:50	Yan Zhu: <i>Multivariate P- and/or Q-polynomial association schemes</i>
17:00 - 17:50	Natalia Tokareva: <i>International Olympiad in Cryptography: apply your mathematical knowledge</i>
17:50 - 18:10	Coffee break
	Contributed talks
	<i>Chair: Tao Feng, BJTU</i>
18:10 - 18:35	Daniil Goshkoder: <i>Code constructions for non-adaptive group testing</i>
18:35 - 19:00	Anastaliya Vasilyeva: <i>On completely regular codes with low adjacency in Manhattan metric</i>
19:00 - 20:00	Dinner
20:00 - 22:00	Problem solving: Minicourse 4
	<i>Chair: Daniil Goshkoder</i>

Wednesday, August 13

07:30 - 09:45	Breakfast
	Keynote Talks
	<i>Chair: Yan Zhu</i>
10:00 - 10:50	Tao Feng: <i>Cyclic Steiner quadruple systems: constructions and classifications</i>
11:00 - 11:50	Alexander Gavrilyuk: <i>Intersecting families of spanning trees in complete bipartite graph</i>
11:50 - 12:10	Coffee break
	Keynote Talks
	<i>Chair: Elena V. Konstantinova</i>
12:10 - 13:00	Vladislav Kabanov: <i>New constructions of divisible design graphs</i>
13:00 - 14:50	Lunch
14:50 - 15:40	Sasmita Barik: <i>Reciprocal eigenvalue properties of graphs</i>
15:40 - 16:00	Coffee break
	Keynote talks
	<i>Chair: Alexander Gavrilyuk</i>
16:00 - 16:50	Ivan Mogilnykh: <i>Minimum distances of LDPC codes in 5G standard</i>
17:00 - 17:50	Viktor Byzov: <i>Strongly regular digraphs with parameters $(22, 9, 6, 3, 4)$ and the explicit construction of infinite families of strongly regular digraphs</i>
17:50 - 18:10	Coffee break
18:00 - 19:00	Social events: <i>Tour to the NSU Dome</i>
19:00 - 20:00	Dinner
20:00 - 21:00	Social events: <i>Tour to the NSU Dome</i>

Thursday, August 14

- 07:30 - 09:45 Breakfast
Minicourse 3
Chair: Shaofei Du
- 10:00 - 10:50 Tao Feng: *Lecture 5*
 11:00 - 11:50 Tao Feng: *Lecture 6*
 11:50 - 12:10 Coffee break
Minicourse 4
Chair: Denis Krotov
- 12:10 - 13:00 Grigory Kabatyansky: *Lecture 5*
 13:00 - 14:50 Lunch
 14:50 - 15:40 Grigory Kabatyansky: *Lecture 6*
 15:40 - 16:00 Coffee break
Plenary and contributed talks
Chair: Vladimir Potapov
- 16:00 - 16:50 Alexey Glebov: *Some aspects of the coalition domination problem*
 17:00 - 17:25 Hamid Golmohammadi: *Coalitions in graphs: A survey and recent results*
 17:25 - 17:50 Yanni Pei: *Positivity problem of three-term recurrence sequences*
 17:50 - 18:10 Coffee break
Contributed talks
Chair: Vladimir Potapov
- 18:10 - 18:35 Polina Kaidash: *Super domination polynomial of a graph*
 18:35 - 19:00 Xiaoping Lu: *Discrete analytic functions on the Gaussian lattice*
 19:00 - 20:00 Dinner
 20:00 - 22:00 **Problem solving: Minicourse 3**
Chair: Shikang Yu

Friday, August 15

- 07:30 - 09:45 Breakfast
Minicourse 3
Chair: Shaofei Du
- 10:00 - 10:50 Tao Feng: *Lecture 7*
 11:00 - 11:50 Tao Feng: *Lecture 8*
 11:50 - 12:10 Coffee break
Minicourse 4
Chair: Denis Krotov
- 12:10 - 13:00 Grigory Kabatyansky: *Lecture 7*
 13:00 - 14:50 Lunch
 14:50 - 15:40 Grigory Kabatyansky: *Lecture 8*
 15:40 - 16:00 Coffee break
Plenary and contributed talks
Chair: Valeriy Bardakov
- 16:00 - 16:50 Andrei Tetenov: *Self-similar dendrites with finite boundary and their associated graphs*
 17:00 - 17:25 Mahliyo Kadirova: *On self-similar dendrites with infinite ramification in finite dimensional space*
 17:25 - 17:50 Lilia Grunwald: *On the critical group of the cone over a sandwich graph*
 17:50 - 18:10 Coffee break
Contributed talks
Chair: Sasmita Barik
- 18:10 - 18:35 Matthew Bernard: *Partition function of bipartite graph embedding*
 18:35 - 19:00 Artem Kravchuk: *Constructing segments of quadratic length in $\text{Spec}(T_n)$ through segments of linear length*
 19:00 - 20:00 Dinner
 20:00 - 22:00 **Problem solving: Minicourse 4**
Chair: Daniil Goshkoder

Saturday, August 16

- 07:30 - 09:45 Breakfast
Keynote talks
Chair: Elena V. Konstantinova
- 10:00 - 10:50 Saul A. Blanco Rodriguez: *Some properties of prefix-reversal graphs*
Contributed talks
Chair: Valeriy Bardakov
- 11:00 - 11:25 Alex Iskra: *Orders of products of class transpositions*
11:25 - 11:50 Pavel Sokolov: *Some examples of crossed G -algebras*
11:50 - 12:10 Coffee break
Contributed talks
Chair: Valeriy Bardakov
- 12:10 - 12:35 Yaroslav Gostyukhin: *Classification of Rota-Baxter operator on algebra $H_4^{(+)}$*
12:35 - 13:00 Kseniya Zimireva: *Linear representation of cactus groups by automorphisms of free module*
13:00 - 13:10 *Closing*