



Mathematical Society  
of South Eastern Europe



Aristotle University of  
Thessaloniki

# SOUTH EASTERN EUROPEAN MATHEMATICAL OLYMPIAD FOR UNIVERSITY STUDENTS

## PROGRAM

# SEEMOUS 2020

MARCH 3-8, THESSALONIKI, GREECE



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## ID CARD DESCRIPTION

All the SEEMOUS participants, Leaders, Deputy Leaders, Observers, Contestants, Organizers and Staff must wear their ID card all times. If you lose your ID card, please contact the SEEMOUS office immediately for replacement. The colors used for ID cards are as follows:

Category	Color
Leaders Deputy Leaders Observers Organizers Staff	black and white
Contestants	blue and white



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## WELCOME MESSAGE

Dear Participants, Dear Guests,

It is our pleasure to welcome you to the 14th edition of the South Eastern European Mathematical Olympiad for University Students - SEEMOUS 2020.

We would like to express our gratitude to the Executive Committee of the Mathematical Society of South Eastern Europe (MASSEE) for trusting us to organize here in Thessaloniki the 14th edition of SEEMOUS. We are glad and honored to host such an important event in Greece, here in Thessaloniki.

Just like in the previous editions, SEEMOUS 2020 creates the premises for students around the world to encounter their forces in the common passion, Mathematics. This Olympiad is a great opportunity for establishing future links of scientific collaboration and friendship between our universities and our countries and we hope that in this edition of the olympiad these expectations will be reached.

During these days, you shall also have the chance to experience glimpses of our culture and our traditional hospitality.

Welcoming you all, we wish you a nice and pleasant stay here in Thessaloniki!

Good luck and success to all participants!

**The Organizing Committee of SEEMOUS 2020**



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about the

## Aristotle University of Thessaloniki

Aristotle University of Thessaloniki (AUTH) was founded in 1925 as the second Greek University and today it is the biggest in the country. It comprises 11 Faculties organized into 41 Schools. Operates 41 bachelor degree and 68 master degree programmes in individual Faculties and Schools, as well as interdisciplinary, inter-university and international. Furthermore, it has 23 collaborations with foreign universities for co-supervised PhD, for Greek and foreign doctoral candidates. 43.452 undergraduate and 8.000 postgraduate and PhD students (4.121 are foreign) are registered at AUTH. The Teaching and Research Staff are more than 2.000 and the total support staff around 1000 people. AUTH participates actively in International Meetings (IAU, EUA, COIMBRA, EMUNI, AUFFrancophonie, European University of Beijing, TIME etc), as well as in 35 International Associations, Organizations and Networks and 5 International Student Associations. In the framework of European Educational Programmes, The South Eastern European Mathematical Olympiad for University Students with International Participation (SEEMOUS) was launched in 2007 by the Mathematical Society of South Eastern Europe.

The School of Mathematics has been opened since 1928; together with the Schools of Physics, Chemistry, Biology, Geology and Informatics, it is one of the six divisions of the Faculty of Sciences.



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about the  
**South Eastern European  
Mathematical Olympiad for  
University Students**

The South Eastern European Mathematical Olympiad for University Students with International Participation (SEEMOUS) was launched in 2007 by the Mathematical Society of South Eastern Europe.

The Mathematical Society of South Eastern Europe (MASSEE) is established on 1st March 2003. The main scope of the Association is to join the forces of all the communities that are involved and further collaborate for adding value to the common ground for actions in the area.

The previous editions of SEEMOUS took place as follows:

- 2007 – Agros, Cyprus
- 2008 – Athens, Greece
- 2009 – Argos, Cyprus
- 2010 – Plovdiv, Bulgaria
- 2011 – Bucharest, Romania
- 2012 – Blagoevgrad, Bulgaria
- 2013 – Athens, Greece
- 2014 – Iași, Romania
- 2015 – Ohrid, FYROM
- 2016 – Protaras, Cyprus
- 2017 – Ohrid, FYROM
- 2018 – Iași, Romania
- 2019 – Devin, Bulgaria



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# COMMITTEES

## MASSEE Committee

- **President:** Doru Ștefănescu, Romania
- **Vice President:** Peter Boyvalenkov, Bulgaria
- **Vice President:** Andreas Philippou, Cyprus
- **Treasurer:** Anargyros Fellouris, Greece
- **Member:** Andrian Naco, Albania
- **Member:** Zoran Kadelburg, Serbia
- **General Secretary:** Manolis Kritikos, Greece

## MASSEE Olympiad Committee

- Gregoris Makrides (Chair), Cyprus
- Radu Gologan, Romania
- Sava Grozdev, Bulgaria

## Organizing Committee

- Nicholas P. Karampetakis - Chairman
- Ioannis Kafetzis
- Panagiotis Tzounakis - Web Page
- Maria Tsitsilianou - Secretary



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## Problem Selection Committee

- Asen Bozhilov, Sofia University "Saint Kliment Ohridski"
- Petar Stoev, University of Architecture, Civil Engineering and Geodesy (UACEG).
- Todor Todorov, Technical University of Gabrovo
- Dimitrios Betsakos, Aristotle University of Thessaloniki
- Georgios Gavrilopoulos, National and Kapodistrian University of Athens
- Nikolaos Roidos, University of Patras, Greece
- Aleksa Malcheski, Republic of North Macedonia      Saints Cyril and Methodius University of Skopje
- Cornel Baetica, University of Bucharest
- Corina Forascu, Alexandru Ioan Cuza University of Iasi
- Alexandru Negrescu, University Politehnica of Bucharest
- Marcel Roman, "Gheorghe Asachi" Technical University of Iasi
- Mircea Dan Rus, Technical University of Cluj-Napoca
- Tiberiu Trif, Babes-Bolyai University Cluj-Napoca
- Kerven Durdymyradov, The State Energy Institute of Turkmenistan
- Yusupbay Ermetov Turkmenistan, Turkmen Agricultural Institute
- Nurmuhamet Gurbanmammedov, Magtymguly Turkmen State University
- Pirmyrat Gurbanov, International University for the Humanities and Development
- Gurtmyrat Motukov, Turkmenistan      National team of Turkmenistan
- Ivan Gadjev, Sofia University "Saint Kliment Ohridski"
- Stoyan Kapralov, Technical University of Gabrovo
- Stanislava Stoilova, University of Architecture, Civil Engineering and Geodesy (UACEG).
- Gabriel Mincu, University of Bucharest
- Vasile Pop, Technical University of Cluj-Napoca
- Shahlo Hasanova, International University for the Humanities and Development
- Radu Strugariu, "Gheorghe Asachi" Technical University of Iasi
- Perman Iljanov, International University for the Humanities and Development
- Chrysostomos Psaroudakis, Aristotle University of Thessaloniki
- **Romanos Diogenis Malikiosis - Chairman of the Jury**, Faculty of Sciences, School of Mathematics, Aristotle University of Thessaloniki



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## TEAMS LIST

- Institute of International Relations of the Ministry of Foreign Affairs of Turkmenistan, Turkmenistan
- International University for the Humanities and Development, Turkmenistan
- Magtymguly Turkmen State University, Turkmenistan
- Oguz Han Engineering and Technology University of Turkmenistan, Turkmenistan
- The Institute of engineering-technical and transport communications of Turkmenistan, Turkmenistan
- The State Energy Institute of Turkmenistan, Turkmenistan
- Turkmen Agricultural Institute, Turkmenistan
- Turkmen State Institute of Architecture and Construction, Turkmenistan
- Turkmen State Institute of Economics and Management, Turkmenistan
- Turkmen State Pedagogical Institute named after S.Seydi, Turkmenistan
  
- Lucian Blaga University of Sibiu, Romania
- "Gheorghe Asachi" Technical University of Iasi
- Babes-Bolyai University Cluj-Napoca
- Technical University of Cluj-Napoca, Romania
- University "Alexandru Ioan Cuza" Iasi, Romania
- University of Bucharest, Romania
- University Politehnica of Bucharest, Romania
  
- Saints Cyril and Methodius University of Skopje, Republic of North Macedonia
  
- Sofia University "Saint Kliment Ohridski", Bulgaria
- Technical University of Gabrovo, Bulgaria
- University of Architecture, Civil Engineering and Geodesy, Bulgaria



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- Aristotle University of Thessaloniki, Greece
- National and Kapodistrian University of Athens, Greece
- National Technical University of Athens, Greece
- Technical University of Crete, Greece
- University of Patras, Greece



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# LIST OF PARTICIPANTS

## TEAM LEADERS

First Name	Family Name	Country	University
Asen	Bozhilov	Bulgaria	Sofia University "Saint Kliment Ohridski"
Petar	Stoev	Bulgaria	University of Architecture, Civil Engineering and Geodesy (UACEG).
Todor	Todorov	Bulgaria	Technical University of Gabrovo
Dimitrios	Betsakos	Greece	Aristotle University of Thessaloniki
Georgios	Gavrilopoulos	Greece	National and Kapodistrian University of Athens
Nikolaos	Roidos	Greece	University of Patras, Greece
Aleksa	Malcheski	Republic of North Macedonia	Saints Cyril and Methodius University of Skopje
Cornel	Baetica	Romania	University of Bucharest
Corina	Forascu	Romania	Alexandru Ioan Cuza University of Iasi
Alexandru	Negrescu	Romania	University Politehnica of Bucharest
Marcel	Roman	Romania	"Gheorghe Asachi" Technical University of Iasi
Mircea Dan	Rus	Romania	Technical University of Cluj-Napoca
Tiberiu	Trif	Romania	Babes-Bolyai University Cluj-Napoca
Kerven	Durdymyradov	Turkmenistan	The State Energy Institute of Turkmenistan
Yusupbay	Ermetov	Turkmenistan	Turkmen Agricultural Institute
Nurmuhammet	Gurbanmammedov	Turkmenistan	Magtymguly Turkmen State University
Pirmyrat	Gurbanov	Turkmenistan	International University for the Humanities and Development
Gurtmyrat	Motukov	Turkmenistan	National team of Turkmenistan

## DEPUTY LEADERS

Name	Family Name	Country	University
Ivan	Gadjev	Bulgaria	Sofia University "Saint Kliment Ohridski"
Stoyan	Kapralov	Bulgaria	Technical University of Gabrovo
Stanislava	Stoilova	Bulgaria	University of Architecture, Civil Engineering and Geodesy (UACEG).



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Gabriel	Mincu	Romania	University of Bucharest
Vasile	Pop	Romania	Technical University of Cluj-Napoca
Shahlo	Hasanova	Turkmenistan	International University for the Humanities and Development
Radu	Strugariu	Romania	"Gheorghe Asachi" Technical University of Iasi
Perman	Iljanov	Turkmenistan	International University for the Humanities and Development
Chrysostomos	Psaroudakis	Greece	Aristotle University of Thessaloniki

## OBSERVERS

Name	Family Name	Country	University
Veselin	Gushev	Bulgaria	Sofia University
Marian	Panțiruc	Romania	"Gheorghe Asachi" Technical University of Iasi

## Volunteers (Aristotle University of Thessaloniki)

Name	Surname
Eva	Antoniadou
Ioannis	Charisiadis
Nikolaos	Evgenidis
Alexandros	Gkoulekas
Konstantinos	Kitsios
Vasileios	Makridis
Kosmas-Louis	Meta
Artemis Chrysanthi	Savva
Chara	Soumelidou
Dimitrios	Tsintilidas



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## CONTESTANTS

Forename	Surname	Country	University
Georgi	Aleksandrov	Bulgaria	Sofia University
Petar	Angelov	Bulgaria	Sofia University
Plamen	Ivanov	Bulgaria	Sofia University
Nikolay	Kolev	Bulgaria	Sofia University
Ljuba	Konova	Bulgaria	Sofia University
Viktor	Terziev	Bulgaria	Sofia University
Pavel	Ivanov	Bulgaria	Technical University of Gabrovo
Viktoria	Ivanova	Bulgaria	Technical University of Gabrovo
Rumen	Nikolaev	Bulgaria	Technical University of Gabrovo
Aleks	Grancharov	Bulgaria	University of Architecture, Civil Engineering and Geodesy (UACEG).
Emiliya	Hinkova	Bulgaria	University of Architecture, Civil Engineering and Geodesy (UACEG).
Maria	Petkova	Bulgaria	University of Architecture, Civil Engineering and Geodesy (UACEG).
Gabriela	Petrova	Bulgaria	University of Architecture, Civil Engineering and Geodesy (UACEG).
German	Stoyanov	Bulgaria	University of Architecture, Civil Engineering and Geodesy (UACEG).
Viktoria	Terkova	Bulgaria	University of Architecture, Civil Engineering and Geodesy (UACEG).
Ioannis	Liodis	Greece	Aristotle University of Thessaloniki
Nikolaos	Liouliakis	Greece	Aristotle University of Thessaloniki
Ioannis	Nakos	Greece	Aristotle University of Thessaloniki
Georgios-Nikolaos	Polychronidis	Greece	Aristotle University of Thessaloniki
Georgios	Rousis	Greece	Aristotle University of Thessaloniki
Basilis	Tsepele	Greece	Aristotle University of Thessaloniki
Christos-Angelos	Konidas	Greece	National and Kapodistrian University of Athens
Dimitrios Chrysovalantis	Melas	Greece	National and Kapodistrian University of Athens
Chris	Pandis	Greece	National and Kapodistrian University of Athens
Kyprianos-Iason	Prodromidis	Greece	National and Kapodistrian University of Athens
Ioannis	Bellos	Greece	National Technical University of Athens
Andreas	Charalampopoulos	Greece	National Technical University of Athens
Antonios	Katsampakos	Greece	National Technical University of Athens
Eirini	Miliori	Greece	National Technical University of Athens
Ioannis	Tzachristas	Greece	National Technical University of Athens



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Georgios	Andreadis	Greece	Technical University of Crete
Artemios	Triantafyllou	Greece	Technical University of Crete
Dimitrios	Nikolakopoulos	Greece	University of Patras
Vasileios-Nektarios	Oikonomou	Greece	University of Patras
Georgios	Siokos	Greece	University of Patras
Vasilios	Stamatis	Greece	University of Patras
Viktor	Ignov	Republic of North Macedonia	Saints Cyril and Methodius University of Skopje
Radmila	Misheva	Republic of North Macedonia	Saints Cyril and Methodius University of Skopje
Slavcho	Premcheski	Republic of North Macedonia	Saints Cyril and Methodius University of Skopje
Aleksandar	Trendov	Republic of North Macedonia	Saints Cyril and Methodius University of Skopje
Cristian Stelian	Grecu	Romania	"Gheorghe Asachi" Technical University of Iasi
Gabriel Alexandru	Scînteie	Romania	"Gheorghe Asachi" Technical University of Iasi
Ioan	Stanciu	Romania	"Gheorghe Asachi" Technical University of Iasi
Vlad	Batalan	Romania	"Gheorghe Asachi" Technical University of Iasi
Robert Gabriel	Curpăn	Romania	"Gheorghe Asachi" Technical University of Iasi
Teodor	Anițoaei	Romania	"Gheorghe Asachi" Technical University of Iasi
Ștefan	Bălăucă	Romania	Alexandru Ioan Cuza University of Iasi
Andreea	Manea	Romania	Alexandru Ioan Cuza University of Iasi
Diana	Mirciu	Romania	Alexandru Ioan Cuza University of Iasi
Diana Paula	Mocanu	Romania	Alexandru Ioan Cuza University of Iasi
Georgiana	Murărașu	Romania	Alexandru Ioan Cuza University of Iasi
Dragos	Olteanu	Romania	Alexandru Ioan Cuza University of Iasi
Daniel	Rusu	Romania	Alexandru Ioan Cuza University of Iasi
Radu	Baston	Romania	Babes-Bolyai University Cluj-Napoca
Alexandru	Matei-Bledea	Romania	Babes-Bolyai University Cluj-Napoca
Madalin	Mitrofan	Romania	Babes-Bolyai University Cluj-Napoca
Filip	Munteanu	Romania	Babes-Bolyai University Cluj-Napoca
Victor	Palagniuc	Romania	Lucian Blaga University of Sibiu
Bianca Veronica	Avram	Romania	Technical University of Cluj-Napoca
Raluca	Bozdog	Romania	Technical University of Cluj-Napoca
Andrei	Tămăian	Romania	Technical University of Cluj-Napoca
Marius - Horațiu	Totoian	Romania	Technical University of Cluj-Napoca
Andrei-Robert	Băra	Romania	University of Bucharest
Andrei-Vlad	Cațaron	Romania	University of Bucharest
Dan-Ștefan	Dumitrescu	Romania	University of Bucharest
Andrei Alexandru	Jelea	Romania	University Politehnica of Bucharest
Radu	Mustățea	Romania	University Politehnica of Bucharest
Ștefan Cristian	Popa	Romania	University Politehnica of Bucharest
Andrei	Săceleanu	Romania	University Politehnica of Bucharest



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Akmyrat	Tirkeshov	Turkmenistan	Institute of International Relations of the Ministry of Foreign Affairs of Turkmenistan
Muhammetnur	Bagbekov	Turkmenistan	International University for the Humanities and Development
Aygul	Begenjova	Turkmenistan	International University for the Humanities and Development
Eziz	Charyyev	Turkmenistan	International University for the Humanities and Development
Oguldondi	Gulyyeva	Turkmenistan	International University for the Humanities and Development
Kuvvatmammet	Hajyyev	Turkmenistan	International University for the Humanities and Development
Perman	Iljanov	Turkmenistan	International University for the Humanities and Development
Muhammetbahram	Orazov	Turkmenistan	International University for the Humanities and Development
Akja	Potdyyeva	Turkmenistan	International University for the Humanities and Development
Dovlet	Rozyyev	Turkmenistan	International University for the Humanities and Development
Aymaral	Yazmyradova	Turkmenistan	International University for the Humanities and Development
Mukam	Babayev	Turkmenistan	Magtymguly Turkmen State University
Kerven	Bashimov	Turkmenistan	Magtymguly Turkmen State University
Yhlas	Bashimov	Turkmenistan	Magtymguly Turkmen State University
Merdangeldi	Bayramov	Turkmenistan	Magtymguly Turkmen State University
Dovletmyrat	Gandymov	Turkmenistan	Magtymguly Turkmen State University
Myrat	Sapayev	Turkmenistan	Magtymguly Turkmen State University
Murat	Sapayev	Turkmenistan	Magtymguly Turkmen State University
Resul	Shamuhammedov	Turkmenistan	Magtymguly Turkmen State University
Ahun	Atajanov	Turkmenistan	Oguz Han Engineering and Technology University of Turkmenistan
Begench	Gurbanmammedov	Turkmenistan	Oguz Han Engineering and Technology University of Turkmenistan
Perhad	Mamedkulov	Turkmenistan	Oguz Han Engineering and Technology University of Turkmenistan
Amannazar	Velmyradov	Turkmenistan	The Institute of engineering-technical and transport communications of Turkmenistan
Gurt	Dovletov	Turkmenistan	The State Energy Institute of Turkmenistan
Akmuhammet	Gurbangeldiyev	Turkmenistan	The State Energy Institute of Turkmenistan
Gurbanmyrat	Yemshikov	Turkmenistan	The State Energy Institute of Turkmenistan
Resulberdi	Annamuhammedov	Turkmenistan	Turkmen Agricultural Institute



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Babageldi	Jorayev	Turkmenistan	Turkmen Agricultural Institute
Merdan	Semiyev	Turkmenistan	Turkmen Agricultural Institute
Kadyrberdi	Annabayev	Turkmenistan	Turkmen State Institute of Architecture and Construction
Jepbar	Asgarov	Turkmenistan	Turkmen State Institute of Architecture and Construction
Serdar	Berdiyev	Turkmenistan	Turkmen State Institute of Economics and Management
Baygeldi	Cholukov	Turkmenistan	Turkmen State Institute of Economics and Management
Gozel	Mamedova	Turkmenistan	Turkmen State Pedagogical Institute named after S.Seydi
Diyar	Meredov	Turkmenistan	Turkmen State Pedagogical Institute named after S.Seydi



# PROGRAMME

DAY	STUDENTS		DEPUTY LEADERS		TEAM LEADERS	
	TIME	ACTIVITY	TIME	ACTIVITY	TIME	ACTIVITY
<b>TUESDAY, March 3</b>	12:00-20:00 20:00	Arrival and registration (ABC Hotel) Dinner (KAMARES)	12:00-20:00 20:00	Arrival and registration (Philippion Hotel) Dinner (Philippion Hotel)	12:00-20:00 20:00	Arrival and registration (Philippion Hotel) Dinner (Philippion Hotel)
<b>WEDNESDAY, March 4</b>	8:00 9:00-11:30 11:30-12:30 13:00 -15:00 15:00-20:00 20:00	Breakfast (ABC Hotel) Free time Opening Ceremony (Faculty of Philosophy) Lunch Free time Dinner (KAMARES)	8:00 9:00-11:00 11:00 11:30-12:30 13:00 -15:00 15:00 15:00-20:00 20:00	Breakfast (Philippion Hotel) Free time Transfer to Aristotle University Opening Ceremony (Faculty of Philosophy) Lunch (KAMARES) Transfer to Philippion Hotel Free time Dinner (Philippion Hotel)	8:00 9:00-11:00 11:00 11:30-12:30 13:00 -15:00 15:00 15:30-20:00 20:00	Breakfast (Philippion Hotel) Jury meeting Transfer to Aristotle University Opening Ceremony (Faculty of Philosophy) Lunch (KAMARES) Transfer to Philippion Hotel Jury meeting Dinner (Philippion Hotel)
<b>THURSDAY, March 5</b>	8:00 9:30-14:30 15:00-16:30 16:30 – 20:00 20:00	Breakfast (ABC Hotel) COMPETITION (Faculty of Sciences, A.U.Th.) Lunch (KAMARES) Free time Dinner (KAMARES)	8:00 9:00 9:30-10:30 10:30-14:30 14:30 – 15:30 16:00 16:00-20:00 20:00-21:00 21:00-24:00	Breakfast (Philippion Hotel) Transfer to Aristotle University Answering questions Grading teams and grading schemes Lunch (KAMARES) Transfer to Philippion Hotel Jury meeting : Grading Dinner (Philippion Hotel) Grading	8:00 9:00 9:30-10:30 10:30-14:30 14:30 – 15:30 16:00 16:00-20:00 20:00-21:00 21:00-24:00	Breakfast (Philippion Hotel) Transfer to Aristotle University Answering questions Grading teams and grading schemes Lunch (KAMARES) Transfer to Philippion Hotel Jury meeting : Grading Dinner (Philippion Hotel) Grading
<b>FRIDAY, March 6</b>	8:00 9:00-18:00 20:00	Breakfast (ABC Hotel) Excursion Dinner (KAMARES)	7:30 8:30 9:00-18:00 20:00	Breakfast (Philippion Hotel) Transfer to ABC Hotel Excursion Dinner (KAMARES)	7:30 8:30 9:00-18:00 20:00	Breakfast (Philippion Hotel) Transfer to ABC Hotel Excursion Dinner (KAMARES)
<b>SATURDAY, March 7</b>	8:00 9:00-13:00 13:30 16:30 20:30	Breakfast (ABC Hotel) Free time Lunch (KAMARES) Transfer to Planetarium Dinner & Awards Ceremony	8:00 9:00-13:00 13:00 13:30 16:30 20:30	Breakfast (ABC Hotel) Appeals Approving Final Scores and Medals Lunch (KAMARES) Transfer to Planetarium Dinner & Awards Ceremony	8:00 9:00-13:00 13:00 13:30 16:30 20:30	Breakfast (ABC Hotel) Appeals Approving Final Scores and Medals Lunch (KAMARES) Transfer to Planetarium Dinner & Awards Ceremony
<b>SUNDAY, March 8</b>	8:00 9:00-12:00	Breakfast (ABC Hotel) Departure	8:00 9:00-12:00	Breakfast (ABC Hotel) Departure	8:00 9:00-12:00	Breakfast (ABC Hotel) Departure



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## SEEMOUS - South Eastern European Mathematical Olympiad for University Students

These regulations were approved by the MASSEE (Mathematical Society of South Eastern Europe) on April 1, 2006.

1. The aims of the SEEMOUS include:
  - a. The challenging, encouragement and development of mathematically gifted higher education students in all participating institutions and corresponding countries;
  - b. The fostering of friendly relationships among higher education students and educators of the participating institutions;
  - c. The creation of opportunities for the exchange of information on higher education syllabi and the development of partnerships and networks between the participating institutions;
  - d. The development of young researchers in mathematics and its applications.
2. The official language of the SEEMOUS is English.
3. The SEEMOUS is organized once every year within the first 15 days of the month of March.
4. Countries or universities interested to host SEEMOUS should apply to MASSEE at least 15 months before the date of organization.
5. The SEEMOUS Jury shall consist of all leaders of the participating teams representing an institution.
6. New participants have to be accepted by MASSEE at least three months before participation.
7. Teams represent institutions but results per country will be computed for teams of six students made up by the best six scores of students participating from each country, except if a National team is officially participating. The National teams have to be specified, in writing, by the national Mathematical Society or the Ministry of Education of the country.
8. All decisions by the Jury are based on simple majority unless it is otherwise specified. The Chairman may vote only when a tie break is needed.
9. The Jury could decide to suggest changes to the regulations. Suggestions are submitted to MASSEE by the chairman of the Jury for changes to be applicable from the next Olympiad. Changes in the regulations can only be approved by MASSEE.
10. Deputy leaders may participate in the Jury and they may also replace their leaders in his/her absence.
11. Each participating institution has one vote regardless of the size of their team.



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12. National teams can participate with students not representing institutions or a mixture. If a national team participates with a leader then the leader becomes a member of the jury and has one vote.
13. The minutes of the Jury meeting are approved at the last meeting of the jury and before the closing of SEEMOUS. The Chairman of the Jury of the SEEMOUS is obliged to give the minutes of the Jury meetings to all leaders and to send them to the MASSEE Council.
14. The Jury may consider and decide on any matter raised, which is not covered by any other regulation item, provided that such decision does not violate the constitution of MASSEE.
15. Additional regulations may be added by the Jury, in which case at least two thirds majority is needed. New regulations become effective beginning the next SEEMOUS, provided they are approved by the MASSEE Council.
16. The Chairman of the Jury may call as many day meetings as he/she deems necessary during an SEEMOUS or when at least one third of the participating institutions or national representations request an additional Jury meeting.
17. Proposals to host an SEEMOUS are discussed during a Jury meeting and recommended to MASSEE by the Jury in an order of preference. The MASSEE shall always approve the host countries/institutions of the next two SEEMOUS.
18. Invitations for participation are sent by MASSEE at least two months before the contest day and it should include:
  - a. An invitation up to six students from each institution is sent by MASSEE. Students must be higher education students, who did not complete 120 ECTS (European Credit Transfer System) or the equivalent by the date of the Olympiad;
  - b. An invitation for up to two educators(leader and deputy leader);
  - c. A call for up to three problem proposals with a deadline of one month before the contest date;
  - d. All participants in SEEMOUS will have to cover their own travel, accommodation and subsistence. A participation fee to cover accommodation and subsistence will be determined every year according to the host country and institution. All payments are pre-paid to the local organizer as approved by MASSEE.
19. The SEEMOUS contest shall take place during one day and should have duration of 5 hours. The contest paper shall consist of four problems, each carrying 10 points for a total of 40 points maximum.
20. Each country/institution except the host institution can propose up to three problems and they should be mailed to MASSEE special Jury secretariat at least one month before the day of the contest. The proposed problems should include their solutions and the field of mathematics that are covering. The proposed problems are given to the Problem Selection Committee appointed by MASSEE.



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21. The Problem Selection Committee should make a short list of at most 50, but not less than 20 of the problems proposed and present it to the Jury for a final problem selection. The rest of the proposed problems are kept confidential and returned to the team leader of the country/institution, which has proposed them.
22. The days before the contest, the leaders, the Jury and members of the Problem Selection Committee shall meet and accommodate at a place different and at distance from the place where students stay. During this meeting, the final contest paper will be decided and approved, translated into different languages and approved and multiplied for the contest. No member of this Committee may communicate by any means with any person other than the members of this meeting and no telephone calls will be allowed until the contest begins. If it is found absolutely necessary for someone to make a phone call, then this will have to be done at the presence of at least two leaders from different countries/institutions other than one hosting the SEEMOUS.
23. Each student contestant will submit solutions in the English language. Solutions may be written only on paper provided by the Organizing Committee.
24. Each student contestant must work independently. Violation of this provision will result in disqualification of the student contestant from the SEEMOUS. The hosting country/institution should make provisions for preventing the use of any dishonest means during the contest.
25. Student contestants are not permitted to bring any books or papers or calculators into the examining rooms. The only instruments permitted in the contest are writing and mechanical drawing instruments. Any student contestant making use of any prohibited item may be disqualified from the SEEMOUS.
26. During the first half-hour, only, of the examination period, each student contestant may submit, on special notepaper provided, written questions for considerations by the Jury. Each paper with such questions shall be given, first to the Chairman of the Jury, and then to the team leader of the country from which the student comes. The leader will translate the question into English and will propose an answer. If the Jury approves the answer, the leader will write the answer on the paper with the student contestant question. This paper shall be given to the Chairman of the Jury for verification before it is returned to the student contestant who submitted the question.
27. The student contestant's solutions will be assessed in a group evaluation process where all leaders and deputy leaders will participate. The official scores are decided by the coordinators of each problem.
28. Problem coordinators will be appointed for each problem, whose responsibility will be to accept and discuss appeals by leaders for assigned scores and correct scores, if necessary. A leader may appeal an assigned score for a specific problem to the Coordinator of the specific problems. If the two cannot agree, the appeal and the reason for rejecting the appeal will be forwarded to the Chief Coordinator who



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makes the final decision. Final decisions of the Chief Coordinator are accepted by the Jury by default.

29. The type of prizes to be awarded are: Gold Medal, Silver Medal and Bronze Medal. Special prizes may be awarded for particularly meritorious and elegant solutions. A certificate of Honorable Mention shall be awarded to each student contestant who does not receive a prize and who has obtained full marks on at least one question. The total number of prizes will not exceed two thirds of the total number of student contestants participating and the Gold, Silver and Bronze medals will be distributed in a ratio closely approximating 1:2:3. A Certificate of Participation shall be given to all student contestants.
30. The schedule of a SEEMOUS event should not exceed 6 nights and may look like the following:
  - 1<sup>st</sup> day: Arrival and Jury meeting.
  - 2<sup>nd</sup> day: Opening Ceremony and Jury meeting for problem selection.
  - 3<sup>rd</sup> day: Contest Day. Papers are saved, approved by the Chairman of the Jury and numbered. Names are hidden.
  - 4<sup>th</sup> day: Marking of papers by the leaders and deputy leaders. Jury meeting to approve results and medals.
  - 5<sup>th</sup> day: Excursion and awards day.
  - 6<sup>th</sup> day: Departure.
31. Each hosting institution or country must ensure quality of accommodation and food to reflect the payment of the participants. Also, it has to ensure free use of Computer facilities and Internet access, free copy service and a free excursion for all.
32. No hosting institution can violate or modify a regulation without the agreement of MASSEE.



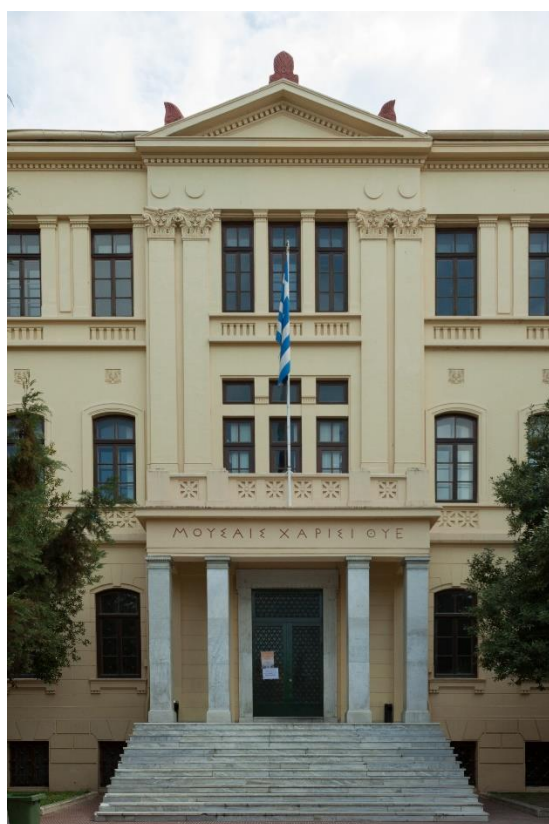
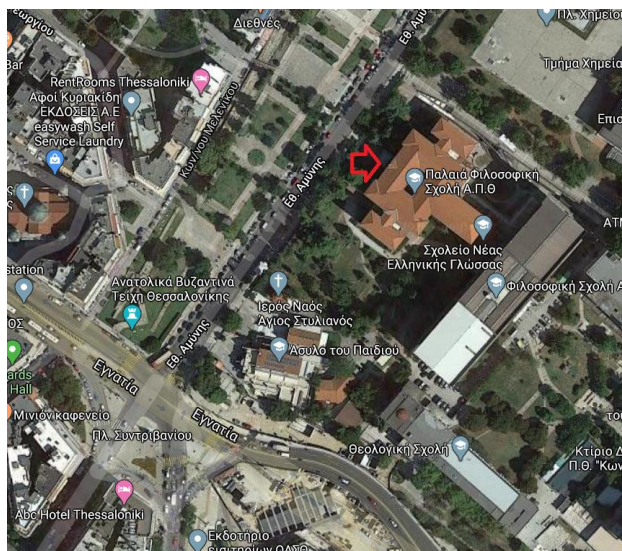


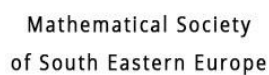
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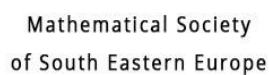
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The opening ceremony of SEEMOUS 2020 takes place in the Old Building of the Faculty of Philosophy of the Aristotle University of Thessaloniki.







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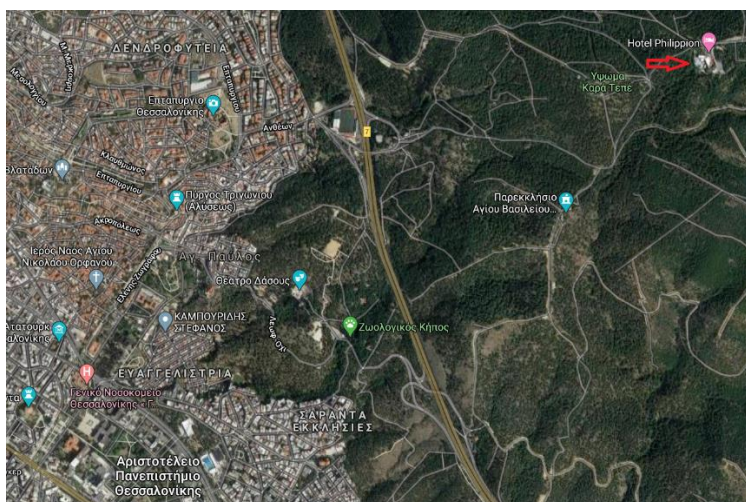


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The Leaders will be accommodated during the first three nights in the **Phillipion Hotel**, Thessaloniki (7,2 Km. from ABC hotel). There exist shuttle bus for free transfer to and from the city centre within a pre scheduled timetable.



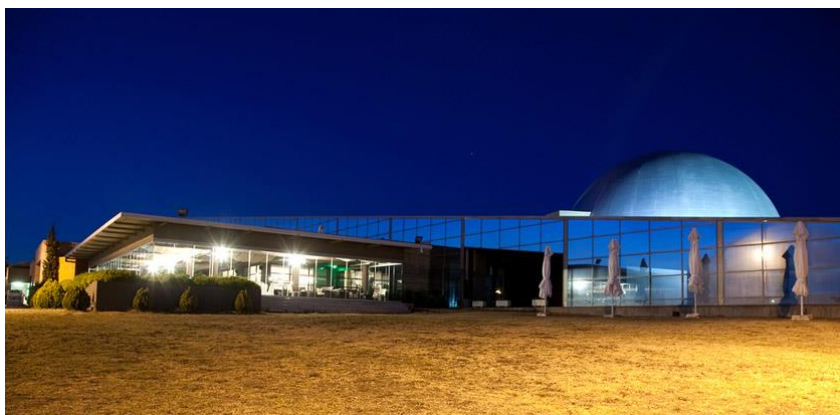


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The Award Ceremony and the Gala Dinner will take place at the Planetarium of Thessaloniki (8,9 Km from ABC Hotel).



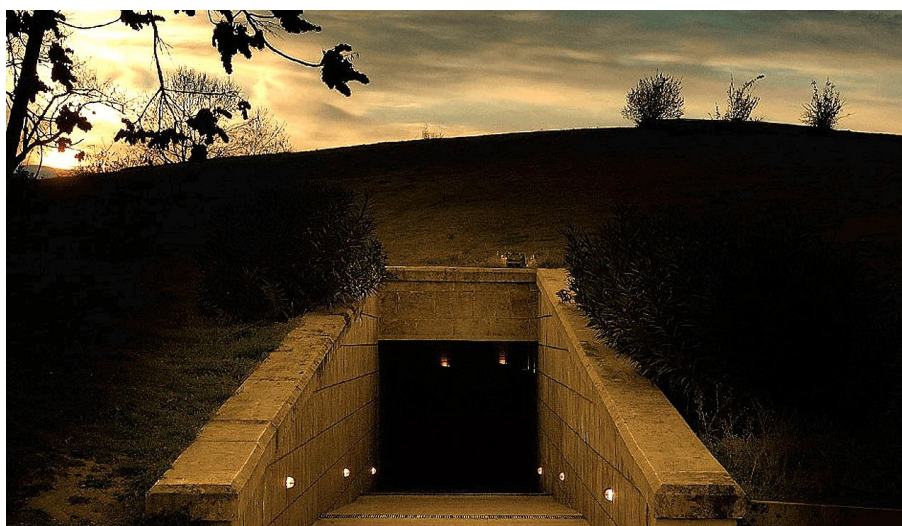


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The excursion is optional and will be at the royal capital of Macedon (Aigai) in Vergina. We shall also have lunch in the town of Edessa where we shall visit the Edessa Waterfalls. All the students must bring their identity card or passport for free entrance to the museum.



Royal capital of Macedon (Aigai) in Vergina



Edessa Waterfalls





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## ABOUT THESSALONIKI

Thessaloniki (520 km. north of Athens) is the second largest city of Greece and the most important centre of the area. Built near the sea (at the back of the Thermaïkos Gulf), it is a **modern metropolis** bearing the marks of its stormy **history** and its **cosmopolitan** character, which give it a **special beauty** and charm.

Take a **tour in the centre** of Thessaloniki and plan to visit its **nearby destinations**. Also, while being in Thessaloniki it is worth going up to **Halkidiki**.

### Visit Thessaloniki's Archaeological sites

- The **ancient forum** (dated to the late 2<sup>nd</sup> or the early 3<sup>rd</sup> century AD) with squares, porticoes, additional buildings and odeum (293-395 AD), the palace complex of Galerius Maximianus (4th c. AD), the thermae, the hippodrome, the temples and other monuments and moveable finds (among them mosaics of exquisite art) brought to light in excavations and surveys. In the south square, is the famous Stoa of the Idols, which was two-storeyed and lavishly decorated.
- The Triumphal Arch of Galerius (Kamara), built in AD 305 to commemorate his military successes in general in the eastern provinces of the Roman Empire.
- The Rotunda is an early 4<sup>th</sup> century building which later was converted into a Christian church.





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## Visit Thessaloniki's Byzantine monuments

Thessaloniki, with its host of **Byzantine monuments** (due to its significance during the Byzantine period), justifiably is considered an open-air museum of Byzantine art. Wandering through the city, it is worthwhile to see:

- The **churches** of **Acheiropoietos** (5<sup>th</sup> century) a three-aisled, timber-roofed basilica, the **Holy Wisdom of God** (Hagia Sophia) (7<sup>th</sup> century), the **Panaghia (Virgin) Chalkeon** (1028), **Hosios David** (12<sup>th</sup> century), **St Panteleemon** (late 13<sup>th</sup> or the early 14<sup>th</sup> century), is of four-columned cross-in-square type, Ayioi Apostoloi (1310-1314), Taxiarches (14<sup>th</sup> century), Panagouda a three-aisled basilica with significant icons, Agios Ioannis Prodromos (Nymphaion), Vlatadon monastery a 14<sup>th</sup> century foundation of which only the katholikon and two cisterns within the precinct survive, Ayios Demetrios a splendid basilica dedicated to the patron saint and protector of the city, etc.
- The **byzantine walls** of the city.
- The **archaeological site** in 3 Septemvriou St., with remnants of a cemetery basilica, a martyrion and Early Christian graves.
- The **byzantine bathhouse** (late thirteenth century).
- The **Heptapyrgion** castle was raised in stages, from the early years of the Byzantine Age into the Ottoman period.



## Amazing Ottoman monuments

- The **White Tower** (15<sup>th</sup> century), the hallmark of the city.
- The **Mosques of the Hamza Bey Cami** (15<sup>th</sup> century), the Aladja Imaret Cami (1484) and the Yeni Cami (1902).
- **Hamams** (turkish bathhouses): The Pazar Hamam (15<sup>th</sup> century), the Pasha Hamam (15<sup>th</sup> century), Bey Hamam (16<sup>th</sup> century), Yeni Hamam and the Yahudi Hamam.
- **Bezesteni**, a rectangular building with lead-covered domes and four entrances was built in the late fifteenth century and operated as a cloth market.



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### Discover neighbourhoods and focal points in the city

- The **Old City (Ano Polis)**, in which many notable examples of Ottoman and traditional Macedonian architecture still stand, alongside humble dwellings put up by the refugees who reached Thessaloniki in droves, after the Greek defeat in Asia Minor, in 1922.
- The historical quarter of the **Ladadika**. In recent years, a series of interventions to rehabilitate the urban fabric have helped to enhance the Ladadika as a quarter for leisure pursuits.
- The **traditional markets**: the Modiano, which is housed in a rectangular building of 1922, with pedimented facade and glass roof; the Kapani or Vlais market; Athonos Square and the 'Louloudadika' (literally flower market).
- **Vasilissis Olgas Avenue**, lined with many representative Neoclassical buildings and examples of late 19<sup>th</sup> century eclectic architecture.
- The central **Aristotelous Square**, surrounded by monumental buildings and open to the waterfront for a width of 100 metres.

### Other monuments and buildings in the city:

- **Mylos** (literally mill). An old industrial complex, built in 1924, today have been remodelled to house cultural events and leisure activities, as well as the industrial buildings of the old FIX Brewery and the VILKA plant.
- **Lazarist monastery** (1886) by the monastic order of the Brothers of Mercy, and now used for cultural events.
- **Royal Theatre**
- **Thessaloniki Concert Hall**. A newly-built, magnificent yet austere, multipurpose venue for cultural and other events.
- **YMCA Building**, a building of 1924, with a mixture of Neocolonial and Byzantesque architectural elements.





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## **Museums**

It's worth seeing the **Archaeological Museum**, the **Museum of Byzantine Culture**, the **Folk and Ethnographic Museum**, the **State Museum of Contemporary Art**, the **Teloglion Foundation of Art**, the **Thessaloniki Cinema Museum**, the **Thessaloniki Science Center and Technology Museum**, etc.

The above information for Thessaloniki is from <http://www.visitgreece.gr/en> where you can download a map from Thessaloniki and find much more information for Thessaloniki and other cities of Greece.



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## USEFUL INFORMATIONS

<b>CURRENCY</b>	EURO 1 EUR = 1.95583 BGN 1 EUR = 4.76660 RON 1 EUR = 3.81955 TMT 1 EUR = 61.6216 MKD 1 EUR = 26.6866 UAH
<b>TIME</b>	GMT+2
<b>WATER</b>	Drinkable
<b>Dial Codes</b>	+30

## USEFUL PHONES

<b>Emergency (Police, Hospital, Fire Dept.)</b>	The European Emergency Number 112
<b>SEEMOUS Organizing Committee</b>	0030 6983 917940



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