



# The 24<sup>th</sup> International Olympiad in Informatics

ALL INFO



The 24th International Olympiad in Informatics

**ITALY**

lake garda - lombardy

# i*i* Keys

**MEETING ROOM 1**

Translation Room

**MEETING ROOM 2**

ISC Room

**MEETING ROOM 3**

IC Room

**MEETING ROOM 4**

GA Meeting Room



Wifi zone



# Lago di Garda



# welcome FRANCESCO PROFUMO

Minister of Education,  
University and Research



On behalf of the Italian Government and of the Ministry of Education, University and Research it is my great honour to welcome to Italy all the participants to the 24th International Olympiad in Informatics (IOI 2012).

The IOI is not only an important competition for individual contestants from different countries. This international meeting is also a great opportunity to increase cooperation and peace among young people coming from all over the world.

Thanks to the social and cultural activities that will be part of your pleasant stay, we hope you will also have time to relax, make lots of new friends and enjoy the beautiful landscape of Lake Garda, with its historical, cultural and tourist attractions. Moreover, two marvellous trips have been organized - to Venice and Milan: two cities which are rich in arts and Italian culture and which I'm convinced you will love. Hosting the IOI for the first time in Italy is de-

initely a great opportunity for our country and for our education system. Our schools are presently going through social and cultural changes. We strongly believe we need to improve learning through technology, which combines collaborative teamwork and individual skills.

Information technology will enable learners and teachers to achieve greater results. For this reason technology is an essential part of education, in a rapidly changing world. And we thank you for bringing this awareness – and this spirit – to the competition.

We hope you make the most of your time in our county and take back with you fond memories of your stay in Italy.

So enjoy yourselves and we wish you the best of luck in the competition.

*Francesco Profumo*

# welcome GIUSEPPE COLOSIO

Director General  
Education Authority  
for Lombardy



On behalf of the IOI 2012 National Organizing Committee and all the teachers and students of our schools, I am very pleased to welcome all of you, contestants, IC and ISC members and guests coming from eighty-two different countries, to Sirmione and Montichiari, Lake Garda, for the 24th International Olympiad in Informatics. For the last twenty years the International Olympiad in Informatics (IOI) has been a major event on the international scene. Since 1989, when the first edition took place in Pravets, Bulgaria, the International Olympiad in Informatics has challenged the brains of secondary school students. With commitment, exchange of scientific and cultural experiences, healthy competition and intercultural sensitivity as its main values, this competition combines culture and innovation, excellence and inclusion. During your stay, you will have the exciting opportunity to meet new people from all over the world, creating a lively network of abilities, knowledge and human experiences.

We believe that education needs such a lively network, knowledge needs technology. And human experience needs communication. A virtuous circle that we can build and share with the aim of increasing cultural awareness, using technology to create, to be innovative and to build new perspectives.

This is the reason why we have named the IOI 2012 after Leonardo Da Vinci, the Italian genius who combined arts and science, and who will be the inspiration behind this competition. Leonardo's Motto is: "Once you have learnt to fly, you will always walk on the ground looking up to the sky, because once you have been there, you will always long to return there".

This is our wish.

Enjoy your time in Lombardy and... good luck everybody!

*Giuseppe Colosio*

# welcome GIULIO OCCHINI

Director General AICA  
The Italian Computer Society



AICA, The Italian Computer Society, is very glad to welcome the competing teams, the accompanying tutors and all guests to the 24th IOI held in Italy, on Lake Garda.

For AICA, which has worked in synergy with the Italian Ministry of Education to select and train our national teams for more than 10 years, hosting the International Contest now truly represents the coronation of a long and constructive experience.

Our Society is traditionally close to the world of young people, especially those with a scientific vocation. For this special year we have developed a survey aimed at identifying the best ways of selecting and nurturing young talents in Europe in order to improve our capability in this area. This survey will be made available to the whole IOI community.

The week ahead of us is very intense, mixing competitions, conferences and technical

meetings with challenging cultural initiatives such as the planned tours to Milan and Venice. Please accept my best wishes for an enjoyable stay in Italy and may you return to your own countries enriched by a memorable experience.

Good luck to all contestants!

*Giulio Occhini*



# About IOI

*The International Olympiad in Informatics (IOI)* is one of the most prestigious scientific competitions in the world for high-school students. The competition tasks are of algorithmic nature; however, the contestants have to show several basic IT skills such as problem analysis, algorithmic analysis and design, data structure design, programming and testing. The winners of the IOI belong to the brightest young computer scientists in the world.

Designed as one of the International Science Olympiads, the primary goal of the IOI is to stimulate interest in Computer Science (Informatics) and Information Technology. Another important goal is to bring together exceptionally talented students from various countries and have them share scientific and cultural experiences.

## IOI Committees

### **International Committee**

Richard Forster, *United Kingdom, President*; Madhavan Mukund, *India, Executive Director*; Kanchit Malaivongs, *Thailand*; Peter Taylor, *Australia*; Greg Lee, *Chinese Taipei*; Bakhyt Matkarimove, *Kazakhstan*; Valentina Dagiene, *Lithuania*; David Ginat, *Israel*; Kresimir Malnar, *Croatia*; Krasimir Manev, *Bulgaria*; Eljakim Schrijvers, *Netherlands*; Giuseppe Colosio, *Italy*.

### **International Scientific Committee**

Benjamin Burton, *Australia*; Ling-Jyh Chen, *Chinese Taipei*; Fredrik Niemelä, *Sweden*; Jittat Fakcharoenphol, *Thailand*; Roberto Grossi, *Italy*; Mihai Pătrașcu, *Romania/USA*; Michal Forišek, *Slovakia*; Martin Mareš, *Czech Republic*.

### **Host Scientific Committee**

Bernard Blackham, Paolo Boldi, Matteo Boscariol, Giovanni Campagna, William Di Luigi, Roberto Grossi, Stefano Maggiolo, Giovanni Mascellani, Angelo Morzenti, Giovanni Paolini, Luca Wehrsted.

Sunday  
September  
23 - 2012

 iDaily  
Program

h	contestants	leaders	visitors
7:00 - 8:00	Breakfast		
8:00 - 9:00			
9:00 - 10:00	Arrival - Registration / Activities		
10:00 - 11:00			
11:00 - 12:00			
12:00 - 13:00	Lunch		
13:00 - 14:00			
14:00 - 15:00			
15:00 - 16:00	Arrival - Registration / Activities		
16:00 - 17:00			
17:00 - 18:00			
18:00 - 19:00			
19:00 - 20:00	Dinner		
20:00 - 21:00			
21:00 - 22:00	Free Time		
22:00 - 23:00			
23:00 - 00:00			



Monday  
September  
24 - 2012

 iDaily  
Program

h	contestants	leaders	visitors
7:00 - 8:00	Breakfast		
8:00 - 9:00	Transfer to Montichiari		
9:00 - 10:00			
10:00 - 11:00	Opening Ceremony		
11:00 - 12:00			
12:00 - 13:00	Lunch		
13:00 - 14:00	Lunch		
14:00 - 15:00			
14:00 - 15:00	Practice session	Practice session	Visit to the castle
15:00 - 16:00		Meetings	
16:00 - 17:00	Transfer to Sirmione		
17:00 - 18:00	Free Time		
18:00 - 19:00	Dinner	Dinner	Dinner
19:00 - 20:00			
20:00 - 21:00	Quarantine	Meetings and translation	Free time
21:00 - 22:00			
22:00 - 23:00			
23:00 - 00:00			

Tuesday  
September  
25 - 2012

 Daily  
Program

h	contestants	leaders	visitors
7:00 - 8:00	Breakfast		
8:00 - 9:00	Transfer to Montichiari		Breakfast
9:00 - 10:00	Contest day 1	Clarification requests	Transfer to Brescia
10:00 - 11:00		IOI Conference	Tour of Brescia
11:00 - 12:00			
12:00 - 13:00			Lunch
13:00 - 14:00			
14:00 - 15:00	Lunch		Tour of Brescia
15:00 - 16:00	Results and analysis mode		
16:00 - 17:00			Transfer to Sirmione
17:00 - 18:00	Transfer to Sirmione		Free time
18:00 - 19:00	Free time		
19:00 - 20:00	Dinner		
20:00 - 21:00			
21:00 - 22:00	Free time/ Activities	Meetings	Free time
22:00 - 23:00			
23:00 - 00:00			

Wednesday  
September  
26 - 2012

 Daily  
Program

h	contestants	leaders	visitors
7:00 - 8:00	Breakfast		Breakfast
8:00 - 9:00	Transfer to Gardaland		Transfer to Milano
9:00 - 10:00	Transfer to Gardaland		Transfer to Milano
10:00 - 11:00	Gardaland	Young Talents Conference	
11:00 - 12:00	Gardaland	Young Talents Conference	
12:00 - 13:00	Lunch		Lunch
13:00 - 14:00	Gardaland		Tour of Milano
14:00 - 15:00	Gardaland		
15:00 - 16:00	Gardaland		
16:00 - 17:00	Gardaland		Tour of Milano
17:00 - 18:00	Transfer to Sirmione		Transfer to Sirmione
18:00 - 19:00	Free time	Transfer to Sirmione	
19:00 - 20:00	Dinner	Dinner	Dinner
20:00 - 21:00	Dinner	Meetings and translation	Dinner
21:00 - 22:00	Quarantine	Meetings and translation	Free time
22:00 - 23:00	Quarantine	Meetings and translation	Free time
23:00 - 00:00	Quarantine	Meetings and translation	Free time

Thursday  
September  
27 - 2012

 Daily  
Program

h	contestants	leaders	visitors
7:00 - 8:00	Breakfast		Breakfast
8:00 - 9:00	Transfer to Montichiari		Breakfast
9:00 - 10:00	Contest day 2	Clarification request	Transfer to Gardone R.
10:00 - 11:00		Meetings	Visit of Vittoriale degli Italiani
11:00 - 12:00			
12:00 - 13:00			
13:00 - 14:00		Lunch	
14:00 - 15:00	Lunch		Tour of Salò
15:00 - 16:00	Results and analysis mode		Transfer to Sirmione
16:00 - 17:00			
17:00 - 18:00	Transfer to Sirmione		Free time
18:00 - 19:00	Free time	Meetings	
19:00 - 20:00	Dinner		Dinner
20:00 - 21:00			
21:00 - 22:00	Free time / Activities		
22:00 - 23:00			
23:00 - 00:00			

Friday  
September  
28 - 2012

 iDaily  
Program

h	contestants	leaders	visitors
5:00 - 6:00	Breakfast		
6:00 - 7:00	Breakfast		
7:00 - 8:00	Transfer to Venezia		
8:00 - 9:00	Transfer to Venezia		
9:00 - 10:00	Tour of Venezia		
10:00 - 11:00	Tour of Venezia		
11:00 - 12:00	Tour of Venezia		
12:00 - 13:00	Lunch		
13:00 - 14:00	Lunch		
14:00 - 15:00	Tour of Venezia		
15:00 - 16:00	Tour of Venezia		
16:00 - 17:00	Tour of Venezia		
17:00 - 18:00	Tour of Venezia		
18:00 - 19:00	Transfer to Sirmione		
19:00 - 20:00	Transfer to Sirmione		
20:00 - 21:00	Dinner	Dinner	Dinner
21:00 - 22:00	Dinner		Dinner
22:00 - 23:00	Free time	Meetings	Free time
23:00 - 00:00	Activities		Free time

Saturday  
September  
29 - 2012

 iDaily  
Program

h	contestants	leaders	visitors
7:00 - 8:00	Breakfast		
8:00 - 9:00	Breakfast		
9:00 - 10:00	Tour of Sirmione	Meetings	Tour of Sirmione
10:00 - 11:00			
11:00 - 12:00	Lunch	Lunch	Lunch
12:00 - 13:00			
13:00 - 14:00	Lunch		
14:00 - 15:00	Free time / Activities		
15:00 - 16:00	Free time / Activities		
16:00 - 17:00	Free time / Activities		
17:00 - 18:00	Closing Ceremony Sirmione, Rocca Scaligera		
18:00 - 19:00			
19:00 - 20:00	Farewell Dinner Garda Village		
20:00 - 21:00	Farewell Dinner Garda Village		
21:00 - 22:00	Free time		
22:00 - 23:00	Free time		
23:00 - 00:00	Free time		

Sunday  
September  
30 - 2012

 iDaily  
Program

h	contestants	leaders	visitors
7:00 - 8:00		Breakfast	
8:00 - 9:00			
9:00 - 10:00			
10:00 - 11:00		Departure	
11:00 - 12:00			
12:00 - 13:00			
13:00 - 14:00		Lunch	
14:00 - 15:00			
15:00 - 16:00			
16:00 - 17:00		Departure	
17:00 - 18:00			
18:00 - 19:00			
19:00 - 20:00		Dinner	
20:00 - 21:00			
21:00 - 22:00		Departure	
22:00 - 23:00			
23:00 - 00:00			



# IOI 2012 Tours

## MILAN

Milan, the capital of Lombardy, has a population of 1.3 million people. It is the biggest industrial city in Italy with many different manufacturing sectors and the centre of Italian fashion. It is a magnet for designers, artists, photographers and models. Milan also has an ancient city centre with many fascinating buildings, another reason why so many people from all over the world flock to see this hard-working but vibrant and glamorous city.

Milan Municipality and Assolombarda (the Lombard entrepreneurs association) have organized a day in Milan as outlined below:

### **Morning**

In conjunction with IOI 2012, the Lombardy Regional Education Authority and AICA, together with Assolombarda and UNESCO, have organized an International conference on Young Talent and the Digital Future. The list of speakers includes Ms. Irina Bukova (DG Unesco), Mr. Francesco Profumo (Italian Minister of Education), Assolombarda President, AICA CEO, former IOI Champions, and other personalities. Findings of the survey on Young Talent in Informatics conducted by AICA and IT STAR will be



Milan Cathedral - photo by Giovanni Dall'Orto - Wikimedia

presented during the conference and a copy of the study distributed to attendees.

### **Afternoon**

After a buffet lunch in Assolombarda, a walking tour through the historic centre of Milan is scheduled and will include: Palazzo Reale, the Duomo (Milan Cathedral), the Galleria Vittorio Emanuele II (an elegant covered arcade where the Milanese love to promenade), Piazza della Scala (world famous La Scala Opera House), Palazzo Marino (Milan City Hall), Piazza Mercanti (a medieval market square), Via Dante and the Sforza Castle (with a visit to the Rondanini Pietà, Michelangelo's last work, and Leonardo da Vinci's drawings).

# IOI 2012 Tours

## VENICE

Venice welcomes the competitors of IOI 2012, soon to discover the charm of its artistic and architectural heritage.

The visit starts with a cruise along Venice's main waterway, the Grand Canal, which cuts through the heart of the city for almost 4 km.

Many beautiful palaces and churches line the banks of the Canal: the magnificent 17th century Palazzo Labia; the Fondaco dei Turchi founded in the 13th century; the famous Ca' d'Oro, probably the most beautiful example of Venetian floral gothic architecture, and many others.

Just before the Rialto Bridge, there is the lively Pescaria, the fish market, and the Fondaco dei Tedeschi, now the main Post Office. After the bridge are the Ca' Loredan and the Ca' Farsetti, both from the 13th century.

The Canal ends in St Mark's Basin where there will be a pause to take in the Doge's Palace and St Mark's Basilica, Venice's most renowned landmark.

The Doge's Palace ruled the Republic of Venice until 1797. Rebuilt several times, it is decorated with artistic masterpieces, amongst which can be seen paintings by



Venice - photo by *Snillet* - Wikimedia

Tintoretto, Titian and Veronese. At the heart of the Palace is the great Sala del Maggiore Consiglio where, from 1200 on, Venetian nobles gathered to legislate.

St Mark's Basilica, with its characteristic cupolas and precious gold mosaics, was built in 828 to house the remains of St Mark, stolen from Alexandria by two Venetian merchants.

The trip ends with a visit to the Arsenal, the source of Venetian sea power since the 12th century. The powerful ships built here enabled the creation of the Venetian commercial empire and its defence against Turkish expansion. The arsenal was organised like an assembly line and covered a vast area.

## IOI 2012 Tours

# GARDALAND / BRESCIA

### **Gardaland amusement park**

Gardaland is the most renowned amusement park in Italy, the one with the longest history and one of the highest reputations in Europe. In 2005, the magazine Forbes ranked Gardaland as fifth among the amusement parks in the world! Lying on the south-eastern shores of Lake Garda, the amusement Park offers themed areas ranging from history to geography, space and fantasy. The huge variety of attractions aim at satisfying a truly diversified crowd: from early childhood to third age, from teen groups to families.

### **Brescia**

Overlooked by an imposing castle, Brescia seems to hide its treasures jealously. It is enough to have a walk in piazza del Foro where the ruins of the Roman temple, theatre and basilica lie, or to stroll round the wonderful domus (villas) in the nearby museum to experience the Roman age again. This archaeological area and the monastic complex of San Salvatore-Santa Giulia are registered in the UNESCO World Heritage List. The Duomo Vecchio (old cathedral) and the Broletto are outstanding examples of Medieval architecture. The Loggia and



Magic Mountain - photo by Caulfieldh - Wikimedia

the church of Santa Maria dei Miracoli are gems of the Renaissance. Tiziano left his mark in the church of Santi Nazaro e Celso. The Duomo Nuovo (new cathedral) has an imposing white Botticino marble façade. Not to mention many other churches, squares, fountains and palaces which hide airy courtyards and spectacular gardens. Brescia is also at the peak of the national economic survey and it is the heir of an ancient tradition of handcraft, industry and trade.

The town is the proud homeland of the historic Mille Miglia (Thousand mile) car race. Every year, in May, numerous veteran car enthusiasts come from all over the world to take part in the competition.

# IOI 2012 Tours

## LAKE GARDA

### **Gardone Riviera and Salò**

Gardone Riviera, a village on the shores of Lake Garda, used to be an important centre for the cultivation of olives, lemons and limes. In 1921 Gardone became the residence of the soldier and poet Gabriele D'Annunzio (1863-1938). On a slope overlooking the lake he realized, with the help of the architect Maroni, a complex of buildings, streets, squares, gardens, waterways and an outdoor theater. He named the area "Italian Vittoriale", in memory of his "incomparable life 'and of the feats he accomplished during the First World War. Salò, founded by the Romans, became the capital of a vast territory during the period of Venetian rule (1423-1796). Its mayor ruled the town and the countryside with a mandate to administer justice too. From 1943 to 1945 it was the seat of the government of the Italian Social Republic.

### **Sirmione**

Sirmione is an ancient fishing village nestled on a peninsula sticking out into the water of Lake Garda for about 4 km, in a beautiful natural setting. Known since ancient times for its healthy water, it is a resort of international fame and it has earned several times the



Sirmione - from our repository

"Blue Flag", awarded to locations that stand out for water quality, clean beaches and level of tourist services. The town is rich in artistic and historical treasures embedded in the romantic atmosphere of narrow streets and small squares. The Rocca Scaligera (XIII c.) dominates the town entrance. Completely surrounded by water, the castle is a miniature architectural jewel of towers, courtyards and drawbridge. The churches Sant'Anna della Rocca (XIV c.), Santa Maria Maggiore (XV c.), San Pietro in Mavino (VIII c.) are of great artistic importance. A pleasant walk through olive groves leads to the Grotte di Catullo, the remains of the largest uncovered Roman villa in northern Italy.

## Tutors

Silvano Begni  
Cristina Bosetti  
Massimo Di Litta  
Andrea Gnani  
Cinzia Greco  
Adriano Rampoldi  
Cristina Sollazzo  
Conny Winzenburg

Daniel Bollini  
Giovanni Boni  
Leonardo Bonzi  
Arianna Briccola  
Cristiana Mihaela Brindas  
Matilde Buratto  
Rachele Carraro  
Martina Cascino  
Luca Casero

Laura Donadoni  
Wabi Ofure Erobomhan  
Angela Fantinato  
Anna Fedorova  
Paola Ferrandi  
Matteo Ferrari  
Giulia Forte  
Abramo Fratus  
Vanessa Fulciniti

## Guides

Giulia Accardo  
Andrea Aceti  
Laura Amagliani  
Rebecca Amato  
Paolo Archetti  
Enrico Artuso  
Sara Aspesi  
Gloria Barbaras  
Andrea Basso  
Tommaso Bastianello  
Daniele Berardi  
Manuela Bianchi

Irene Cattaneo  
Michele Cavadini  
Matteo Cavalli  
Elena Cerri  
Tetyana Chelysheva  
Giulia Colombo  
Giorgia Conti  
Tommaso Cortesi  
Nicola Crespi  
Edoardo Dalla Guarda  
Sara De Scolasticis  
Beatrice Denna  
Noemi Dimasi

Ayla Galbiati  
Andrea Jacopo Gallucci  
Andrea Markus Gentile  
Daniele Ghiotti  
Gianluca Giacchi  
Gloria Giovanditti  
Michelly Gomez Alvarez  
Giovanna Gottardi  
Clara Grassi  
Margherita Guala  
Giulia Gualtieri  
Ilaria Guzzetti  
Pantea Kalantary Rad

# Volunteers

Silvia Limberto

Sarah Lonmon

Sarah Macedonio

Martina Magnaghi

Federico Magnani

Chiara Marangoni

Alberto Marcolli

Filippo Martins

Sabrina Mazzetti

Federica Menzaghi

Davide Merli

Cassandra Mevio Gibert

Dalila Minoia

Nicole Montini

Marta Negri

Alice Neri

Monica Nozza

Marco Occhio

Nancy Ogu

Andrea Omodei

Benedetta Oltolini

Sara Paoletti

Zobia Parveen

Michela Patuzzo

Nicolò Pedrini

Alice Pellegata

Marco Pescatori

Ilaria Piccione

Giorgia Pigni

Veronica Pinetti

Luca Pinelli

Fabio Pirrone

Marta Poletti

Samantha Pollicita

Chiara Pozzoni

Zahrà Rahmé

Clio Righetti

Silvia Romano

Elisabetta Ronchi

Nina Zoe Russ

Giulia Russo

Maria Silvia Saccani

Mariia Samochna

Valentina Sandini

Gaia Santambrogio

Alberto Sartori

Jacob David Schaafsma

Elisa Sganzerla

Diego Simonato

Kevin Sinani

Andrea Squassina

Irene Stanghellini

Hakim Gabriele Thurner

Vittorio Tosi

Vittoria Rachele Trevisan

Andriy Tyyko

Camilla Valente

Giulia Vezzoli

Jonathan Danilo Wijeratna

Cecilia Zamboni

Alessandro Zambù

Velia Zattoni

Jialuo Zhang

Vincent Zwaan

# Delegations (A-H)



## Albania

Endrit Xhina  
Alda Kika  
Ledio Berdellima  
Arnold Drita  
Christ Ligori  
Rushan Xhaja



## Argentina

Rogelio Garcia Llanio  
Hugo Ryckeboer  
Lucas Agudiez  
Franco Assenza  
Carolina Lang  
Diego Vazquez



## Armenia

Armen Andreasyan  
Tigran Piliposyan  
Robert Davtyan  
Hrair Harutyunyan  
Tigran Mamikonyan  
Armen Vardanyan



## Australia

Jarrah Lacko  
Christopher Chen  
Michael Chen  
Daniel Goldbach  
Joshua Lau  
Nicholas Laver  
Andree Phillips  
Christopher Shannon



## Austria

Helmut Achleitner  
Johann Fellner  
Fabian Hammerle  
Markus Hasenöhrl  
Thomas Pinetz  
Thomas Tangl



## Azerbaijan

Ramin Mahmudzade  
Ismayil Sadigov  
Elmi Ahmadov  
Tahir Alizade  
Rashid Gaziyeu  
Tural Gulmammadov



## Bangladesh

Mohammad Kaykobad  
Saleha Kaykobad  
Dhananjoy Biswas  
Md Nafis Sadique  
Nur Muhammad Shafiullah  
Bristy Sikder



## Belarus

Irina Kirinoviich  
Anatoli Aksenchyk  
Adam Bardashevich  
Gennady Korotkevich  
Siarhei Kulik  
Uladzislau Padsiolkin



## Belgium

Damien Leroy  
Joachim Ganseman  
Floris Kint  
Victor Lecomte  
Hannes Vandecasteele  
Benoît Vernier



## Bolivia

Willmar Pimentel Sossa  
Fabian Caihuara Sossa  
Sergio Koller Vargas  
Diego Nuñez Duran  
Alex Pizarro Jiménez



## Bosnia and Herzegovina

Alvin Abdagić  
Igor Ševo  
Daniel Ferizović  
Andrej Ivaniš  
Aleksanda Kelečević  
Ishak Numanagić



## Brazil

Ricardo Anido  
Wanderley da Silva  
André de Sousa  
Marcos Kawakami  
Caíque Lira  
Renato Pinto Junior



## Bulgaria

Emil Kelevdjiiev  
Stoyan Kapralov  
Yordan Chaparov  
Georgi Georgiev  
Rumen Hristov  
Hristo Venev



## Canada

Troy Vasiga  
J.P. Pretti  
Vitalik Buterin  
Daniel Hui  
Angus Kong  
Geoffry Song



## Chile

Alexander Tchobanov  
Luis Herrera  
Jorge Lobos  
Cristobal Miranda  
Gabriel Norambuena



# Keys

 Delegation Leader  Deputy Leader  Contestants  Invited observer



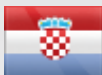
**China**

Hong Wang  
Baolin Yin  
Yuqing Ai  
Yuzhou Gu  
Chao Li  
Peilin Zhong



**Colombia**

Mario Cruz  
Rafael Mantilla  
Alan Navarro  
Diego Niquefa  
Jaime Silva  
Manuel Vergara



**Croatia**

Ivo Separovic  
Matija Osrecki  
Domagoj Cevid  
Dominik Gleich  
Antun Razum  
Marin Tomic



**Cuba**

Raidel Marichal Aguilar  
Yuri Alcántara Olivero



**Cyprus**

Michalakis Tortouris  
Miltiades Charilaou  
Savvas Mitsikouridis  
Panayiotis Panayiotou  
Michalis Psalios  
Andreas Stavrou



**Czech Republic**

Zdeněk Dvořák  
Pavel Töpfer  
Jiří Eichler  
Ondřej Hübsch  
Štěpán Šimsa  
Martin Zikmund



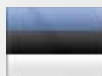
**Denmark**

Jørgen Nielsen  
Knud Fjeldsted  
Simon Eskildsen  
Jeppe Hallgren  
Jakob Knudsen  
Svend Svendsen



**Egypt**

Eslem Wageed  
Haytham Hassan  
Hosam Abd Elraouf  
Youssef Ibrahim  
Omar Obeya  
Ziad Ouf



**Estonia**

Ahto Truu  
Indrek Jentson  
Andres Erbsen  
Jaagup Repän  
Simmo Saan  
Janno Veeorg



**Finland**

Timo Knuutila  
Antti Laaksonen  
Andrei Cramariuc  
Sami Kalliomäki  
Jasse Lahdenperä  
Joonatan Saarhelo



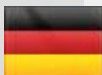
**France**

Mathias Hiron  
Pouly Amaury  
Gabriel Barrutia  
Simon Mauras  
Auguste Olivry  
Jules Pondard



**Georgia**

George Mandaria  
Zaza Gamezardashvili  
Tornike Mandzulashvili  
Nika Nadiradze  
Jimsher Skhirtladze  
Nikoloz Svanidze



**Germany**

Wolfgang Pohl  
Julian Fischer  
Tilmann Bihler  
Julian Labeit  
Tobias Lenz  
Jannes Münchmeyer



**Greece**

Michael Chatzopoulos  
Nikolaos Papaspyrou  
Konstantinos Kanellis  
Evangelos Kipouridis  
Dimitrios Los  
Sotirios Panagiotou



**Hong Kong**

Gong Poon  
Tat Chi Chung  
Pak Hay Chan  
Chun Yin Sampson Lee  
Chun Chi Tsang  
Wai Pan Yik

# i Delegations (H-P)



**Hungary**

Gyula Horváth  
László Zsakó  
Márton Havasi  
Kristóf Marussy  
Zoltán Szenczi  
Gellért Weisz



**India**

Narayan Kumar Krishnan  
Prateek Karandikar  
Amartya Shankha Biswas  
Chirag Gupta  
Kunal Singhal  
Nikhil Tadigoppula



**Indonesia**

Inggriani Liem  
Risan Risan  
Nathan Azaria  
Jonathan Gunawan  
Muhammad Muharrom  
Cakra Wardhana



**Iran**

Mohammad Ali Abam  
Ali Sharifi Zarchi  
Alireza Farhadi  
Saeed Ilchi ghazaan  
Mohammadreza  
Maleki Ghahfarrokhi  
Seyed Hamed Valizadehtoosi



**Ireland**

Gary Conway  
Robert Hanrahan  
Conor Flynn  
Maciej Goszczycki  
Abdullah Mohammad  
Richard Tynan



**Israel**

Oren Becker  
Jonathan Mosheiff  
Daniel Hadas  
Tom Kalvari  
Ohad Klein  
Shahar Mizrahi



**Italy 1**

Luigi Laura  
Andrea Canciani  
Matteo Almanza  
Federico Glauco  
Giuliano Gregori  
Luca Versari



**Italy 2**

Giuseppe Ottaviano  
Salvatore Ingala  
Gabriele Farina  
Giada Franz  
Davide Pallotti  
Sebastiano Tronto



**Japan**

Tetsushi Ito  
Seiichi Tani  
Ikumi Hide  
Kazumi Kasaura  
Kohji Liu  
Shogo Murai



**Jordan**

Mowaffaq Hanandeh



**Kazakhstan**

Sholpan Kirabayeva  
Azhar Rakhletova  
Madi Khamitbekov  
Vyacheslav Kim  
Dauren Muratov  
Aman Sariyev



**Korea**

Jin Young Choi  
Sung Ryul Kim  
Jeongwoo Ji  
Hyeonseop Lee  
Bumsoo Park  
Jihoon Yoon



**Kuwait**

Makki Al Khabbaz  
Zuhair Al Mutawa  
Ali Al Mumin  
Yakoob Al Yakoob  
Yousef Hussein  
Mohsen Saleh



**Kyrgyzstan**

Pavel Pankov  
Timur Oruskulov  
Azamatbek Akhmedov  
Nursultan Aldaierov  
Shakarim Kalandarov  
Alibek Taalaibek uulu



**Latvia**

Martins Opmanis  
Rihards Opmanis  
Nikita Larka  
Aleksejs Popovs  
Ojars Ratnieks  
Marks Zeldes

# Keys

 Delegation Leader  Deputy Leader  Contestants  Invited observer



## Libya

Mohamed Ali  
Mohamed Abdulali  
Safwan Bouna  
Ahmed Khaled  
Ali Qasim  
Amira Sherif



## Lithuania

Jūratė Skūpienė  
Vytytis Banaitis  
Vladimir Daglis  
Karolis Greblikas  
Kęstutis Vilčinskas  
Andrius Žiūkas



## Luxembourg

Nino Silverio  
Laurent Haan  
Michel Breyer  
Gilles Englebret  
Jeff Wagner  
Pol Welter



## Macau, China

Teng Lam  
Kuo Meng Sun  
Kin Heng Cheang  
Ka Chon Fong  
Seng Pan Kou  
Kam Fu Wong



## Macedonia

Mile Jovanov  
Emil Stankov  
Hristijan Bogoevski  
Jovan Krajevski  
Bojan Serafimov  
Kliment Serafimov



## Malaysia

Shien Jin Ong  
Suhaimi Ramly  
Yi Hang Ho  
Zun Yuan Lim  
Chin Lip Soh  
Ying Hong Tham



## Mexico

Enrique Lira  
Marcel Stockli  
Saul De Nova  
Saul Gutierrez  
Freddy Roman  
Edgar Santiago



## Moldova

Iurie Mocanu  
Anatol Gremalschi  
Victor Ciuntu  
Victor Luncasu  
Ion Ureche  
Catalin Vlas



## Mongolia

Choijoovanchig Lkhachin  
Battogtokh Tsaagan  
Govikhuu Basan  
Janchiv Bat-Erdene  
Gantushig Bayasgalan  
Bayarkhuu Lodoidamba



## Montenegro

Milka Damjanovic  
Bozidar Despotovic  
Luka Bulatovic  
Kosta Pavlovic



## Netherlands

Ries Kock  
Willem Van der Vegt  
Pieter Bos  
Willem Melching  
Bouke Van der Bijl  
Koen Wolters  
Leanne Van Vuuren



## New Zealand

Margot Phillipps  
James McCloskey  
Alan Ansell  
Logan Glasson  
Tom Levy  
Tony Sun



## Nigeria

Bamidele Jennie  
Uche Onwuka  
Aminu Folawiyo  
Oluwatosin Joshua  
Aikodon Nosa  
Bindir Umar



## Norway

Åsmund Eldhuset  
Markus Dregi  
Nils Barlaug  
Håkon Holmen  
Arne Sund  
Edgar Vedvik



## Poland

Jakub Radoszewski  
Jakub Łącki  
Bartłomiej Dudek  
Karol Farbis  
Wiktór Kuropatwa  
Wojciech Nadara

# iDelegations (P-V)



## Portugal

Pedro Ribeiro  
Rodrigo Gomes  
Francisco Machado  
Pedro Paredes  
João Ramos  
Afonso Santos



## Romania

Panaete Adrian  
Tutunaru Mihai  
Budău Adrian  
Gavrilă Alexandru  
Buhai Darius  
Voroneanu Ștefan



## Russian Fed.

Vladimir Kiryukhin  
Marina Tsvetkova  
Maxim Akhmedov  
Alexey Gordeev  
Oleg Ivanov  
Egor Suvorov



## Serbia

Dragan Urošević  
Nikola Milosavljević  
Boris Grubić  
Demjan Grubić  
Andrej Ivašković  
Ivan Stošić



## Singapore

Steven Halim  
Jui Sing Teo  
Wei Liang Gan  
Ranald Yun Shao Lam  
Bernard Zhi Yi Teo  
Hubert Hua Kian Teo



## Slovakia

Gabriela Andrejkova  
Vladimír Boža  
Eduard Batmendijn  
Marián Horňák  
Andrej Mariš  
Jakub Šafin



## Slovenia

Darko Pevec  
Jan Berčič  
Sven Cerk  
Matjaž Leonardiš  
Jure Slak  
Patrik Zajec



## South Africa

Pieter Waker  
Mark Danoher  
Ashraf Moolla  
Vaughan Newton  
Robert Spencer  
Sean Wentzel



## Spain

Salvador Roura  
Joan Alemany  
David Balaghi  
Darío de la Fuente  
Dario Nieuwenhuis  
Pol Olivella



## Sweden

Magnus Jedvert  
Oskar Werkelin Ahlin  
Anton Grensjö  
Simon Lindholm  
Johan Sannemo  
Mårten Wiman



## Switzerland

Daniel Graf  
Josef Ziegler  
Johannes Kapfhammer  
Marco Keller  
André Ryser  
Florian Wernli



## Syria

Jafar Alkheir  
Shadi Saleh  
Haidar Abboud  
Kinan Al Sarmini  
Gaith Hallak  
Hussain Kara Fallah



## Taiwan

Pang-Feng Liu  
Chun-Fa Chang  
Liang-Chieh Chen  
Ting-Yuam Cheng  
Cheng-Min Chiang  
Shin-Wei Liu



## Tajikistan

Erazh Dzharmaev  
Alexandr Ismatov  
Dzhamsheed Khaitov  
Behruz Murotov  
Khayyom Odinaev  
Abduquodiri Qurbonzoda



## Thailand

Punpiti Piamsa-Nga  
Sukree Sinthupinyo  
Natthakun Kitthaworn  
Jirayu Luewetwanit  
Sorawee  
Porncharoenwase  
Varot Premtoon

# Keys



Delegation Leader



Deputy Leader



Contestants



Invited observer



## Trinidad Tobago

Noel Kalicharan

Tommy Chen

Shantal Alexander

John Chen

Zachary Subran-Ganesh



## Tunisia

Dorsaf Benna



## Turkey

Osman Abul

Barış Kaya

Abdullah Alperen

Ömer Eren

Yusuf Kalaycı

Alperen Yakut



## Turkmenistan

Merdan Kaibov

Serdar Gandymov

Dovletgeldi Aydogdyev

Ahmet Hudayberdiyev

Begmuhammet Kakabayev

Begench Meredov



## Ukraine

Andrii Gurzhii

Vitalii Bondarenko

Roman Furko

Vitalii Herasymiv

Serhii Nagin

Roman Rubanenko



## United Kingdom

Freddie Manners

David Mestel

Andrew Carlotti

Robin Elliott

Zhaoxin Wang

Andrew Wills



## USA

Brian Dean

Jacob Steinhardt

Johnny Ho

Mitchell Lee

Scott Wu

Daniel Ziegler



## Uzbekistan

Lochinbek Shodiev



## Venezuela

Jose Trinidad Gomez Barreto

Emilio Nazareth Tirado Oviedo

Luis David Arguello Pazos

Dixon David Moran Gonzalez

Jesus Alejandro Soto Agreda

Fernando Luis Valarino Noriega



## Vietnam

Nghia Nguyen

Son Pham

Anh Nguyen

Dung Nguyen

Thanh Nguyen

Dat Vu

# IOI Organization



## Coordinator of the Finance Committee

**Dario Pironi** is the Director of the Brescia Economic Development Area and Director of the Employment and Vocational Training Department of Brescia Provincial Government. For IOI 2012 his intervention is in the area of financial control and accounting, current expenditure, foreign exchange services and POS.

## Coordinator of the Secretarial Committee

Since November 2000 **Monica Gati** has been working as employee in AICA (Italian Computer Society), dealing with ECDL (European Computer Driving Licence). She coordinates the Italian Olympiad in Informatics.



## Coordinator of the Committee for Program Implementation

**Silvana Massobrio** is the Coordinator of the commission for IOI 2012 program implementation, head of the communication department within the regional education authority for Lombardia. Physics graduate and journalist.

## Coordinator of the Communications Agency

**Daniela Rovina** is Communications and PR Manager of AICA, The Italian Computer Society. Her career includes management positions within ICT multinational companies, teaching and management consultancy.

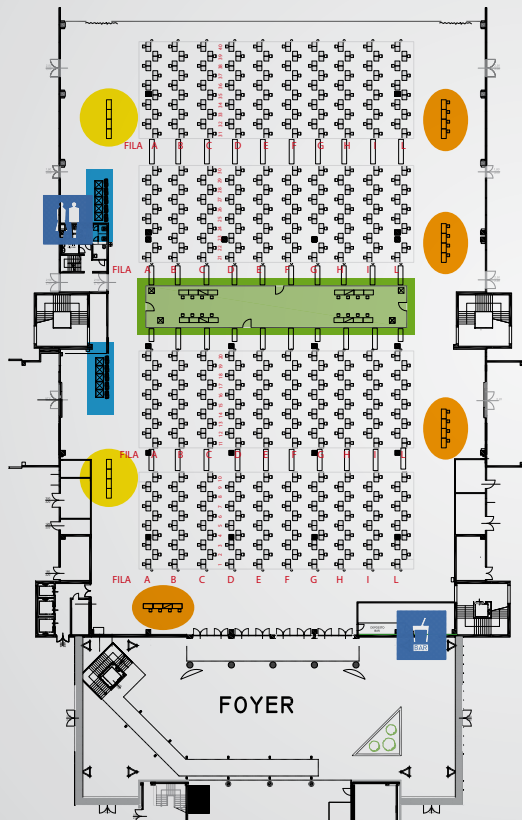


## Coordinator of the Volunteers Committee

**Piero Cattaneo** is headmaster of the Griffini secondary school in Casalpusterlengo and professor at Catholic University of Milano and Piacenza, Department of Pedagogy. He is the coordinator of the volunteers of IOI 2012.

# Competition field Montichiari

- Contestant assistance
- Refreshments
- Control Room
- Contestant WC



# Enjoy Sirmione

## Sirmione: relax, beauty, wellness, health

20% discount on the entrance ticket to of the Wellness Centre “Aquaria” for all the participants in the 2012 IOI.

To get the discount you must show your IOI 2012 pass. Thanks to Terme di Sirmione.

## See Sirmione from a motorboat

You can reach the Castle of Sirmione by motorboat which leaves from the harbour “Sirmione 2” arriving at the Port of the historic centre in front of the Castle (and return trip).

- Sunday 23rd September,**  
from 8.30 PM to 11.30 PM;
- Thursday 27th September,**  
from 8.30 PM to 11.30 PM;
- Saturday 29th September,**  
from 3 PM to 5 PM and,  
from 8.30 PM to 11.30 PM.

You can easily reach the harbour “Sirmione 2” on foot along a walk by the lakeside (about 800 m).

To go aboard the motorboat you must show your IOI 2012 pass.



# Practical INFO

## IOI Information Desk

If you have questions or any issues at all, please contact our IOI Information Desk.

Opening hours: 07.00 – 22.00

Mobile: +39 3666513198

## IOI Identification Card

All IOI 2012 participants must wear their ID cards at all times. You will need your card to access each IOI 2012 facility, to eat meals, and to take part in activities and excursions planned during the week.

## Medical Services

*If you are not feeling well, please contact our medical service near the Reception.*

## Access to Wifi network IOI 2012

The wireless network covers the main public areas of the Garda Village (reception, conference hall, swimming pool, restaurant) and has SSID IOI2012.

On connecting to any website a login form appears where the username and password received should be entered

The connection has unlimited duration, while individual sessions have a timeout of 5 minutes.

Browsing and authentication are possible with only one device at a time.

For any problem, please refer to the IOI Infopoint at the entrance.

## IOI 2012 on the web

- Website,  
[www.ioi2012.org](http://www.ioi2012.org);
- Newsletter,  
[www.ioi2012.org/newsletter](http://www.ioi2012.org/newsletter);
- Facebook,  
[www.facebook.com/loi2012italy](http://www.facebook.com/loi2012italy);
- Youtube,  
[www.youtube.com/user/loi2012media](http://www.youtube.com/user/loi2012media);
- Twitter,  
<https://twitter.com/IOI2012>;

## MyIOI2012 Competition

Report on the International Olympiad in Informatics with your own tweet, photo or video (30 sec. max.!) The best entries will be published on the website of the event.

Tweets, photos and videos must be relevant to one or more of the many aspects of IOI: competition, digital culture, multiculturalism, cooperation.

## How to enter the competition

Post a tweet with the hashtag [#myioi2012](https://twitter.com/IOI2012). In the case of photos or videos post a link to the resource.

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Faculty of Informatics



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educazione



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NEXUS EDIZIONI



Liceo Veronica Gamba di Brescia



Cremona COGLINE DI CREMONA



ASSOCIAZIONE FILARMICA "TESDECO CAMPANINI" BANEA CINEBIA DI BRESCIA



Comune di Brescia

Thanks to Municipality of Milano



The 24th International Olympiad in Informatics

**ITALY**  
lake garda - lombardy

[www.ioi2012.org](http://www.ioi2012.org)

[info@ioi2012.org](mailto:info@ioi2012.org)