

# IMO POST 2015

THE 56<sup>TH</sup> INTERNATIONAL MATHEMATICAL OLYMPIAD  
JULY 4-16, 2015 IN CHIANG MAI, THAILAND



06

# ON THE CRAFT TRAIL

Chiang Mai is the craft capital of Thailand. Over its long history, communities of artisans have settled and flourished here, and today the province has one of the largest concentrations of cottage industries in the world. A dazzling range of handicrafts is available, from woodcarving to silk to silverware, lacquerware, pottery and much more. The level of artistic skill is high, and Chiang Mai's craftsmen take pride in doing each job superbly.

San Kamphaeng, just east of Chiang Mai city, is home to many of the province's best workshops, factories and showrooms. On our upcoming visit to San Kamphaeng, you can see the crafts from their beginnings to finished products. Bo Sang, known as the "Umbrella Village," is devoted exclusively to the making of brilliantly colored parasols. The frames and handles of these parasols are made from bamboo while the shades are made from paper, silk or cotton adorned with beautiful free-form designs.

A few minutes drive from Bo Sang is the "Silk Village". There you will find dozens of weavers' workshops selling colorful silk fabrics and finished items including dresses, jackets, scarves and ties. The entire silk production process is done in the village, from planting mulberry trees to raising silk worms to silk spinning and silk weaving.

Another stop on our itinerary is the village of Ban Khoen ("Lacquerware Village"), home to generations of lacquer craftsmen. These artisans make beautiful houseware products using frames of wood or bamboo painted with layers upon layers of lacquer. Each coating must be dried and polished before the next can be applied. Some pieces require more than a dozen coats, so production cannot be rushed. Styles range from simple to very elaborate, including extremely refined mother-of-pearl inlay and gold-leaf embellishments.

Other famous Chiang Mai handicrafts include Sa paper, the textured hand-made paper unique to northern Thailand. Made from the bark of a kind of mulberry tree, the paper is sometimes combined with flower petals and leaves to create beautiful stationery and desk accessories. Celadon pottery is another popular tourist souvenir. Glazed in shades of green or blue, celadon tableware and home décor items from Chiang Mai can be found in the homes of craft lovers all over the world.



+Colorful hand-painted parasols-at Bo Sang

Chiang Mai's rich craft tradition is enhanced by the folk art of the hilltribes who live in the surrounding mountain terrain. Many of these hilltribes are suppliers to the handicraft shops around the city. If you take a walk around the Night Bazaar, you will see a wide range of hilltribe crafts including colorful textiles, embroidered clothing and bags and silver jewelry. The Night Bazaar also offers all the other handicrafts mentioned above. Take some home as a souvenir of your stay in Chiang Mai!

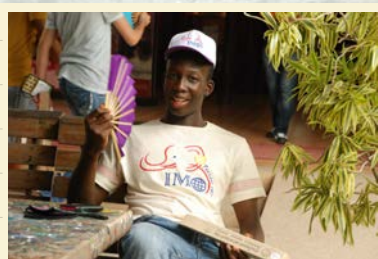
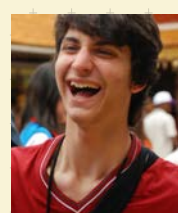


A silversmith at Wat Srisuphan, known as the Silver Temple, works on an ornate piece



# SHOTS OF THE DAY

03





# IMO POST 2015 NEWS

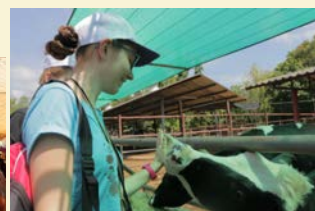
July 12 was the first excursion day for IMO 2015 contestants. With their work now done, they spent the day taking in some of Chiang Mai's most famous sights. Contestants split into 2 groups, the first visiting Maesa Elephant Camp and Huay Hong Khrai Royal Development Study Centre and the second visiting Wat Phra Singh, Doi Suthep and Sankampaeng.



## ROUTE #1

In the morning, the first group visited Maesa Elephant Camp in Maerim District, home to a large family of pachyderms. The animals put on a spectacular show, during which they painted a watercolor, showed off their prowess with a basketball and played soccer. Visitors also got to see elephants bathe and to feed and interact with them.

Following a morning with the elephants, contestants visited Huay Hong Khrai Royal Development Study Centre in Doi Saket District, where they were welcome by Mr. Viriya Chuaybamrung, a former inspector of the Thai Department of National Parks, Wildlife and Plant Conservation. After a briefing on the center's work, the visitors explored learning trails designed to offer knowledge about water resources, forestry, crop cultivation, intensive farming, livestock and dairy cattle, fishery and frog farming.







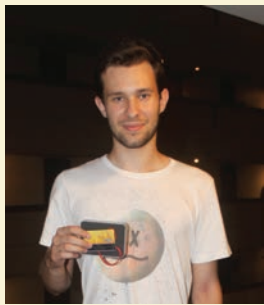
## CONGRATULATIONS!!



Oliver Nick from  
Team Luxembourg  
for cracking our  
Daily Challenge  
problem #2.



Team Malaysia for problems #3 and #4.



Mirza Arnaut from Team  
Bosnia and Herzegovina  
for problem #4.

*They collected their prize, a 16 GB  
collectable IMO thumb drive.*

*Hurry!!! You still have a chance to win!*



## ANNOUNCING THE IMO 2015

## FRIENDSHIP PRIZE!

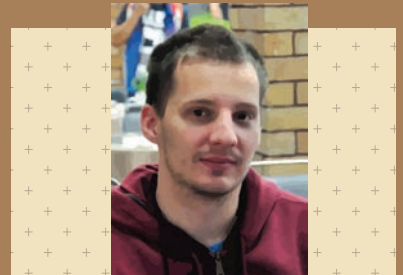
IMO 2015 brings together participants from around the world. To encourage everyone to get to know each other, we hereby invite all to nominate your favorite new friend for **THE FIRST-EVER FRIENDSHIP PRIZE**. Each participant can nominate 1 person, the only condition being that your nominee **CANNOT BE YOUR OWN TEAMMATE**. The person who receives the most votes will be our Friendship Prize Winner. We also have prizes for 3 lucky voters (to be decided by a lucky draw). Nominate your favorite new friend by email to [IMO2015newsletter@gmail.com](mailto:IMO2015newsletter@gmail.com) by July 13. Be sure to include your nominee's name and country. The list of winners will be published in the July 15 Issue.

If you have an announcement to make, we'll be happy to print it. It can be about a program of study, an important day in your country, or anything else that you think will be of interest to other readers. Email your announcement to [IMO2015newsletter@gmail.com](mailto:IMO2015newsletter@gmail.com). We reserve the right to edit your submission for length and style.

## HAPPY BIRTHDAY



Given Name: Andrei-Bogdan  
Family Name: Puiu  
Country: Romania (ROU)  
Date of Birth: 14/07/1999  
IMO role: Contestant



Given Name: Admir  
Family Name: Beširević  
Country: Bosnia and  
Herzegovina (BIH)  
Date of Birth: 14/07/1991  
IMO role: Observer

## INBOX

Dear madam, dear sir,

according to the offer in the IMO POST 2015 we are sending the following advertisement:

"Hi, my name is Matěj and I am from the Czech Republic. The fate was cruel to me as I live in an apartment with a shared bed - with my male teammate Rado. We even have to sleep under one blanket, yuck! At first, I thought I can make it, but Rado has been way too intimate lately. Thus I am looking for a replacement. If you are a girl (!) interested in this offer, please feel free to send an email to [handsomeczechguy@seznam.cz](mailto:handsomeczechguy@seznam.cz) or just knock at the door 21126. I reserve the right to cancel this offer, even if not fulfilled.

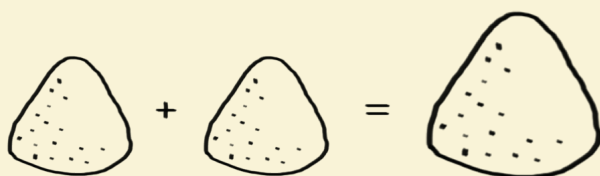
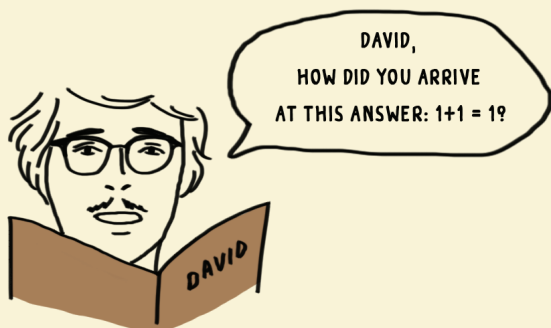
Hi, I am Rado and what's above is not true at all. But nonetheless, if a girl with a girl roommate was to accept this offer, I will gladly move to her previous place."

Apparently, it is a joke. So please if the choice was either to change the wording or not to publish it, please choose the latter (not publishing it). But it would still be a great pleasure and honor for all the citizens of the Czech Republic if this advertisement was published.

Yours faithfully  
Matěj and Rado from the team Czech Republic



$$1+1=?$$



SO

$$1+1=1!$$

END.

## MATH IS FUN

If a  $\sin \theta - b \cos \theta = c$  then prove that,  
 $a \cos \theta + b \sin \theta = \pm (a^2 + b^2 - c^2)^{1/2}$ .

Email your answer to  
 imo2015newsletter@gmail.com.  
 You'll be eligible to win a fabulous prize!

## QUOTE FROM GREAT MATHEMATICIANS

# #6

"The most vitally characteristic fact about mathematics is, in my opinion, its quite peculiar relationship to the natural sciences, or more generally, to any science which interprets experience on a higher than purely descriptive level."

"By and large it is uniformly true that in mathematics there is a time lapse between a mathematical discovery and the moment it becomes useful; and that this lapse can be anything from 30 to 100 years, in some cases even more; and that the whole system seems to function without any direction, without any reference to usefulness, and without any desire to do things which are useful."

John von Neumann (1903-1957), A Hungarian-born American mathematician and polymath, he made important discoveries in set theory, geometry, quantum mechanics, game theory, statistics and computer science.

WE ARE ON THE WEB, TWITTER AND FACEBOOK!

To get the latest IMO 2015 news and updates, go to our WEBSITE: [HTTP://WWW.IMO2015.ORG/](http://www.imo2015.org/)  
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 or Like us on FACEBOOK: [HTTPS://WWW.FACEBOOK.COM/IMO2015CHIANGMAITHAILAND](https://www.facebook.com/imo2015chiangmaithailand)

# THE GHERKIN

Most people may not have heard its name, but many will have seen this fantastic curved skyscraper in the media. I bet it will be in one of your photos if you visit London's world famous Tower Bridge. The building is one of London's landmarks and can be seen from most of the city's tourist attractions. It also holds the distinction of being one of the first buildings to be entirely mathematically modeled on a computer. In fact, its construction would not have been possible without mathematics. 30 St Mary Axe, also known as the Gherkin due to its shape, is a unique structure. Soaring 180 meters above ground, it is three times the height of Niagara Falls. And while other skyscrapers are based on squares and vertical straight lines, it instead relies on some very daring shapes.

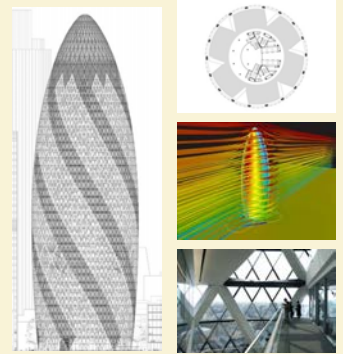


Aerodynamics is one of the most important considerations when designing skyscrapers. The wind movements around the building can create turbulence at the base as well as wind tunnel effects. To reduce these problems, the building's design team tested and simulated the shape mathematically on computers. In addition, six triangular wedges were taken out of the circular plan of each floor to create light wells that bring in lots of natural sunlight and maximize natural air ventilation. As a result, the Gherkin consumes 50% less energy than other buildings of the same size.

Now let's take a look at the Gherkin's sleek exterior. In photos, it looks like it is entirely made up of curved surfaces, but is that actually the case?

Ideally, only curved surfaces should be used, but these are expensive to manufacture. The architects came up with a solution that helped reduce the construction cost. Despite the building's curved appearance, 99% of its skin contains no curved surfaces at all. It is in fact composed of hundreds of flat glass panels, with the only curved piece

making up the lens-shaped cap at the top of the building. Those flat panels consist of triangles and diamonds, which also form a very effective fixed shape. In advanced mathematics, the concept of this approximation can be explained as 'geodesic surfaces'. Today, triangulation of surfaces plays an important role in computer-aided design. In addition to architecture, digital imaging and computer-generated films also rely on mathematics to construct, draw and paint triangulated models of characters and environments.



## References:

1. Perfect buildings: the math of modern architecture, by Marianne Freiberger  
<https://plus.maths.org/content/perfect-buildings-maths-modern-architecture>
  2. The 'Gherkin', London  
<http://www.mathsinthecity.com/examples/gherkin.html>
  3. Creating the Gherkin's curves, London  
<http://www.mathsinthecity.com/sites/creating-gherkins-curves-london>
- Images from
- <http://wspolnota-polska.org.pl/wiadomosci/Mala-Polka-bohaterka-Londynu,526.html>
  - <http://culturalbrazil.org/2014/11/18/brazilian-billionaire-joseph-safray-buys-the-gherkin-for-700m/>

AGENDA		DAY 6, TUESDAY JULY 14	
LEADERS and DEPUTY LEADERS		CONTESTANTS	
7:00 am 9:00 am 12:00 am 1:00 pm-5:00 pm 5:30 pm 7:00 pm	Breakfast Coordination Lunch Excursion Dinner Final jury meeting	7:00 am 9:00 am-12:00 am 12:00 am 5:30 pm	Breakfast IMO Lectures Lunch Dinner
AGENDA		DAY 7, WEDNESDAY JULY 15	
LEADERS and DEPUTY LEADERS		CONTESTANTS	
7:00 am 12:00 am 2:00 pm 3:00 pm-5:00 pm 5:30 pm-9:00 pm	Breakfast Lunch Depart for closing ceremony Closing ceremony Farewell party	7:00 am 12:00 am 3:00 pm-5:00 pm 5:30 pm-9:00 pm	Breakfast Lunch Closing ceremony Farewell party



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