Budapest Semesters in Mathematics

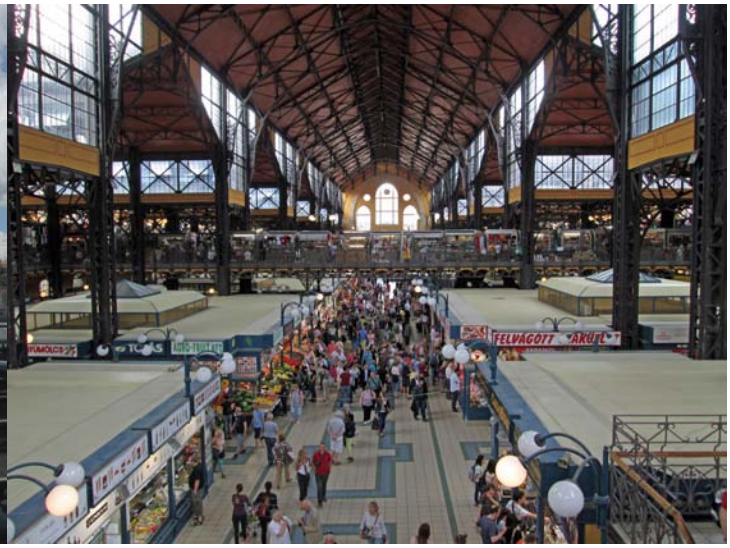
Emily Zhu — Summer 2016

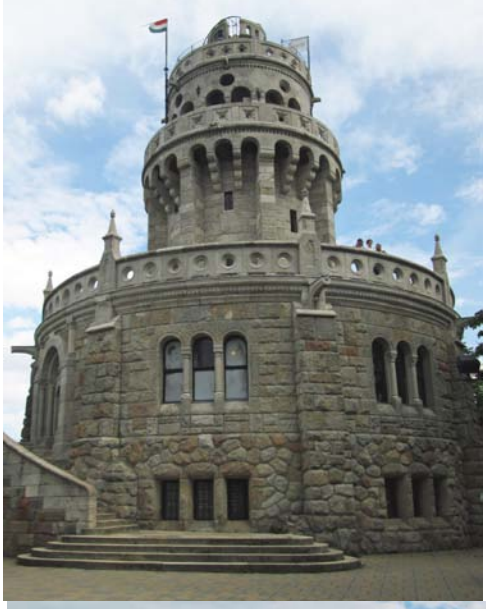
I spent 10 weeks in Budapest: 1.5 weeks taking an introductory language course on Hungarian and 8 weeks (really 7 weeks and a one-week break) taking math classes. Even though I unfortunately spent a majority of this time being sick, there was still plenty of time to explore this magnificent city and lots of amazing mathematics!

Top: Danube at Night

Top Row: View from Apartment at 5 am, Margaret Island Japanese Garden, Margaret Island Musical Fountain, Ministry of Agriculture, Lift to Buda Castle and Chain Bridge, Tomb of Kossuth Lajos

Bottom Row: Clouds on the Danube, Margaret Bridge and Pest from Buda, Danube in Szentendre



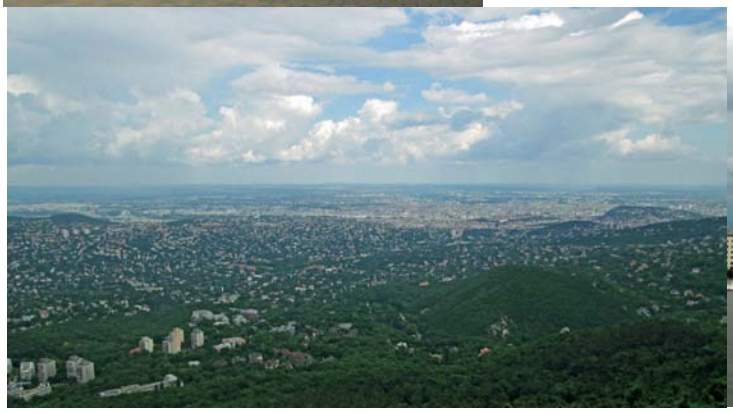


At the **Babilon Language School**, we were introduced to the city of Budapest (which is really Buda, the Danube, and Pest). In class, we all tried to pronounce and conjugate basic Hungarian, but with different sounds for consonants and a mistaken stress turning you from being "happy" to "crazy," this was a challenge that few of us could conquer. We also took a hike up in the Buda Hills, where we saw a splendid view of Budapest from the Elizabeth Watchtower.

Top to Bottom/Left to Right: Buda Castle from Pest, Central Market Hall;

Liberty Statue; Elizabeth Watchtower;

View of Budapest from the Watchtower, Parliament and Pest from Buda



For the BSM Welcome Party, we took an evening cruise on the Danube, where we got to marvel at the beauty of Budapest and meet our professors and other students. We also went to the **Kerepesi Cemetary**, where many prominent figures are buried.

Buda Castle and Chain Bridge, Parliament at Night
Mosaic, Statue of Horsemen, Mausoleum of Kossuth Lajos;
Memorial to Labor Movement, Tomb of Károlyi Mihály, Tomb of Blaha Lujza

We took a trip to **Szentendre** and **Visegrád**, two beautiful towns along the Danube. Szentendre is filled with art galleries and artisan shops while Visegrád has the Royal Palace (of King Matthias) and other castles on the hill as well as access to a "beach" for swimming in the Danube!

Streets of Szentendre, Rooftops and Church of Szentendre;
Baroque Cross in Main Square;
Trees in water, Royal Palace, Hercules Fountain;
Danube, Historical Playground

I visited the **City Park**, which was very close to my apartment. It has lots of open/green space, **Vajdahunyad Castle** (which currently has is the Museum of Agriculture), and various statues and monuments. Very close by are **Heroes' Square**, **Szechenyi Baths**, and the **Budapest Zoo**.

Vajdahunyad Castle, Church by the Castle;
Statue of Anonymous (where Erdős and friends used to meet!);
Bridge between City Park and Heroes' Square, Heroes' Square;
Aardvark, Red Panda (just had a cub!), Tiny Turtles, Fennec, Koala, Prairie Dog (did not escape), Grey crowned cranes with chicks

Margaret Island is located between Buda and Pest and is easily accessible from either side by the Margaret Bridge and Árpád Bridge. The island has many features and activities between gardens, ruins, pools, a track, and more…

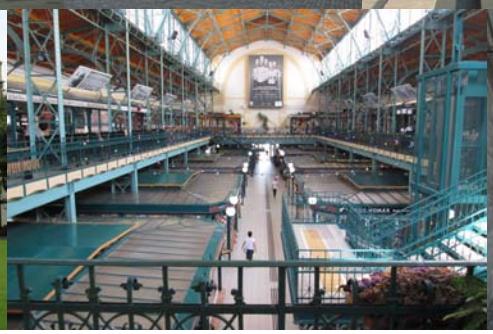
Musical Well, Japanese Garden Waterfall, Japanese Garden;

Rose Garden Trellis, Rose Garden;

Premonstratensian Church, Dominican Convent Ruins, Petting Zoo

...a lot more! (It was really pretty.)

Water tower, Budapest Sign, Centenary Monument;
Musical Fountain, Pest/Margaret Bridge at Sunset;
Musical Fountain, Pest/Margaret Bridge at Night

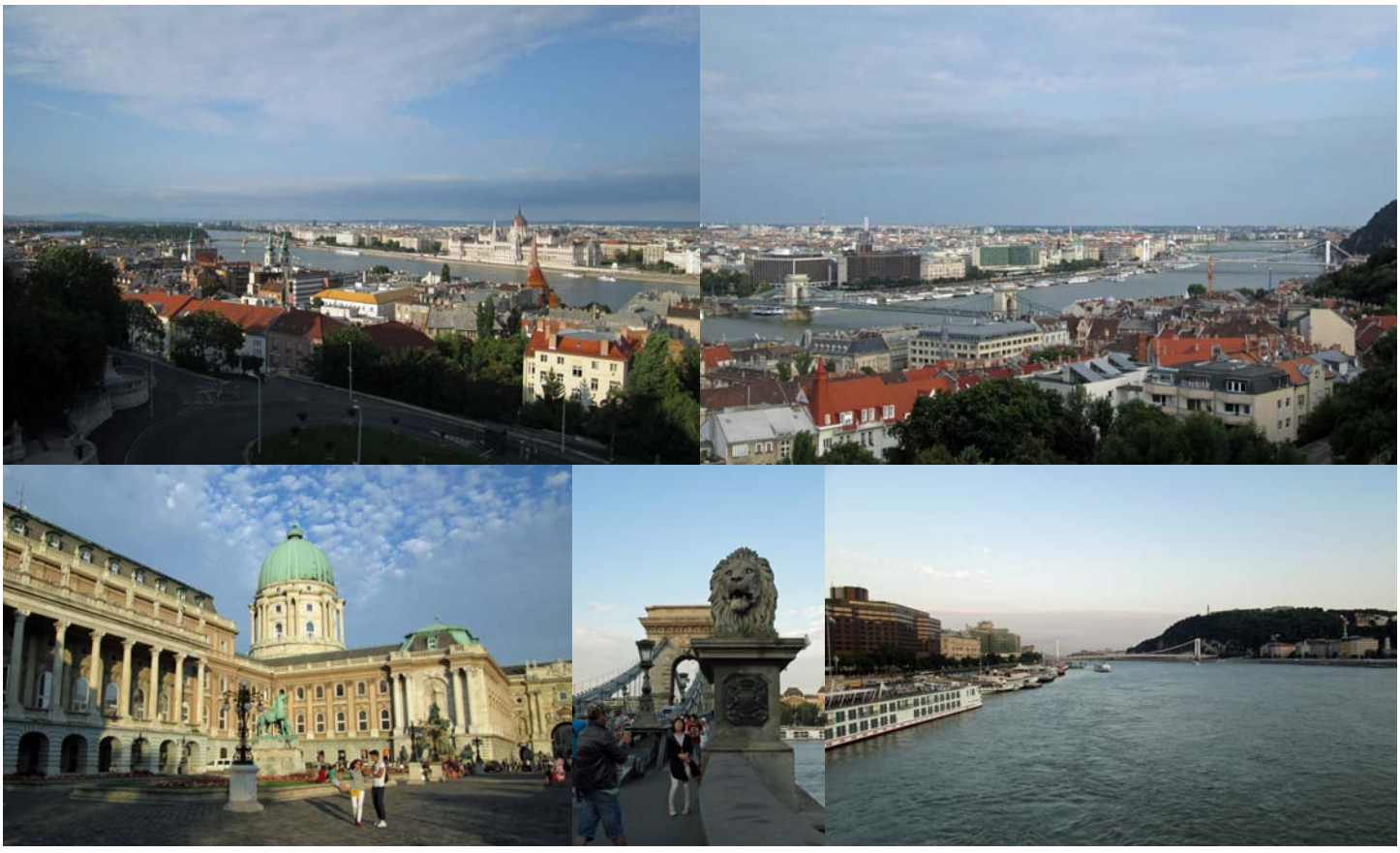


I took a walk from Kossuth Lajos Square (near the **Parliament**) down to **Vörösmarty Square** and further along the Danube. This area is District V: Leopold Town and the Inner City/Town Center.

Parliament from Pest side, Parliament on Danube bank, Parliament and Attila Józef statue;
Kossuth Memorial, Belvárosi Market Hall, Buda from Danube bank;
St. Stephen's Basilica, Vörösmarty Square, Little Princess Statue;
Tram 2 tracks and Elizabeth Bridge, Danube (University of Technology and Economics and Gellert Baths)

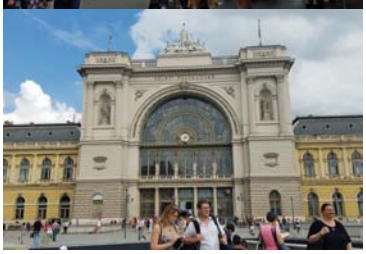
We also visited **Matthias' Church**, **Fisherman's Bastion**, and **Buda Castle**, all which are located on the Buda side. Being by the Danube, these have splendid views of Pest, but they are also beautiful in their own right.

Matthias' Church x3, Fisherman's Bastion x2;
Margaret Island/Parliament/Pest from Fisherman's Bastion, Bridges across the Danube;
Buda Castle, Lion on the Chain Bridge (no tongue!), Danube and Gellert Hill



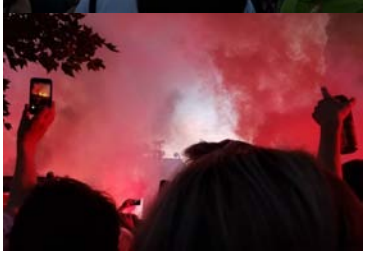
The **Timewheel** located near the City Park

Szimpla, a ruin pub and on Sundays, a farmer's market



Interior/Exterior of **Keleti** Train Station

Going down a very deep Metro…



Football games are intense when Hungary makes the Euro Cup!

The Dohany Synagogue

Mathematics at BSM was simply amazing. I took Combinatorics 2 and Number Theory. Combinatorics 2 provided a sizeable introduction to hypergraph theory, graph theory, and their connection; this class was truly challenging, requiring a deep understanding of concepts and the creativity to connect them to solve problems. Number Theory introduced many ideas on primes and extended them to fields/rings beyond our standard number systems (i.e. polynomial rings) as well as discussed the representability of integers by the sum of squares; this class demonstrated how many other areas of mathematics are necessary for us to understand the numbers we have performed arithmetic with for so long.

Besides solving math problems, we were also given the opportunity to attend talks on mathematics and Hungarian culture as well as have open discussions with current mathematicians about options for our futures.

BSM building (shared with McDaniel's College)

Going abroad has allowed me to better appreciate the quirks and features of different cities (and to find that even Pittsburgh doesn't have the most unpredictable weather!). And although I honestly struggled with adjusting to life in Budapest, this was still genuinely an amazing experience between exploring the city and discovering more beautiful mathematics.

With my lovely roommates and Anna, the wonderful student coordinator who took care of all of us!