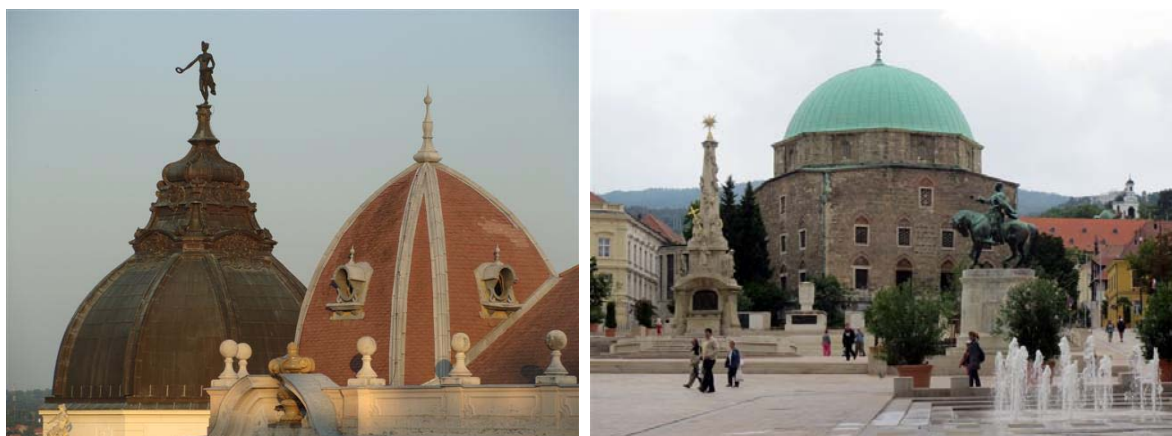


# Bridges Pécs 2010

The Thirteen Annual International Conference of  
Bridges: Mathematical Connections in Art, Music, and Science

Pécs Cultural Center, Pécs, Hungary  
July 24-29, 2010

A Report by  
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**Figure1:** *Some domes from different eras in Pécs.*

As the opening sentence of the website announcement of Bridges 2010 in Pécs says, “The Bridges Conferences, running annually since 1998, bring together practicing mathematicians, scientists, artists, educators, musicians, writers, computer scientists, sculptors, dancers, weavers, and model builders in a lively atmosphere of exchange and mutual encouragement”, and more could be added to the list. One of the most obvious characteristics of any Bridges conference is its diversity, and each participant will experience it in very individual ways, so it would be impossible to write a generalized review of this conference. What follows is an account of my personal recollections of what turned out to be the widest ranging conference so far.

I have attended every Bridges since 2000, so I have come to expect the inspiring and intellectually stimulating environment that is normal for these gatherings, and probably take it for granted more than first-timers. Those that I talked to this year were as impressed and excited as in previous years, and even those who were simply accompanying family members found, contrary to their expectations, that there was much to interest them. That is how first-timers become regulars, and Bridges continues to grow. This year so many submissions were accepted that they could only be accommodated by having a high proportion of “short papers”.

As always the quality of material submitted was very high, and difficult decisions had to be made about which sessions to attend among the four parallel strands. Some presentations developed work that I am already familiar with, and I usually decided just to read up these submissions in the Proceedings, making the choice a little easier for me.

But Bridges is about much more than the talks, and more keeps getting added. An innovation this year was a Film Fest, held on the evening of the first day. The idea originated in the observation that a lot of animated mathematical art and visualizations of mathematical concepts are being produced as the technology becomes easier to use, and there should be a place for such work in Bridges. Since this was the first such event it is understandable that many of the pieces were quite old, and I had seen some of them before. In the future, once the possibilities become more widely known, we can expect to see a higher proportion new work.



**Figure 2:** (L) *Bartók Hall, Hotel Palatinus, the main conference venue*, (R) *from “The Optiverse”, 1998, screened during the Bridges Math/Art Short Movie Festival.*

An example of how the informality and dynamism of Bridges conferences works was illustrated by the inclusion of an unscheduled animation in the Film Fest. On the night before the official opening, as participants were arriving at the hostel accommodation, people were sitting around in the foyer talking, preparing their presentations, showing their latest work and so on. A newcomer to Bridges had some artwork using a simulation of fluid turbulence, and Nathan and Amy Selikoff, the moderators of the Film Fest, happened to be present. They were so impressed that with less than 24 hours notice the schedule was changed to include this work, which I thought was one of the high points of the evening.

Another example of the flexibility of the Bridges organization is provided by the art exhibitions. There is the official exhibition consisting of work that has gone through a process of submission and acceptance, and appears in the catalogue. As usual there was a wide variety of high quality work this year (available on the Bridges website), and everyone will have their own favourites. I admired Mingjang Chen’s *Chaotic Landscape Painting*, which uses the textural elements that arise naturally from iterated function systems to produce a convincing landscape in the traditional Chinese style. I played with linear iterations many years ago, after reading Barnsley’s book, and enjoyed the effects that they produce, but I was never able to use them. This artist has achieved what I could not, and uses more sophisticated computer interfaces that allow a freer, more intuitive use of fractals, however,

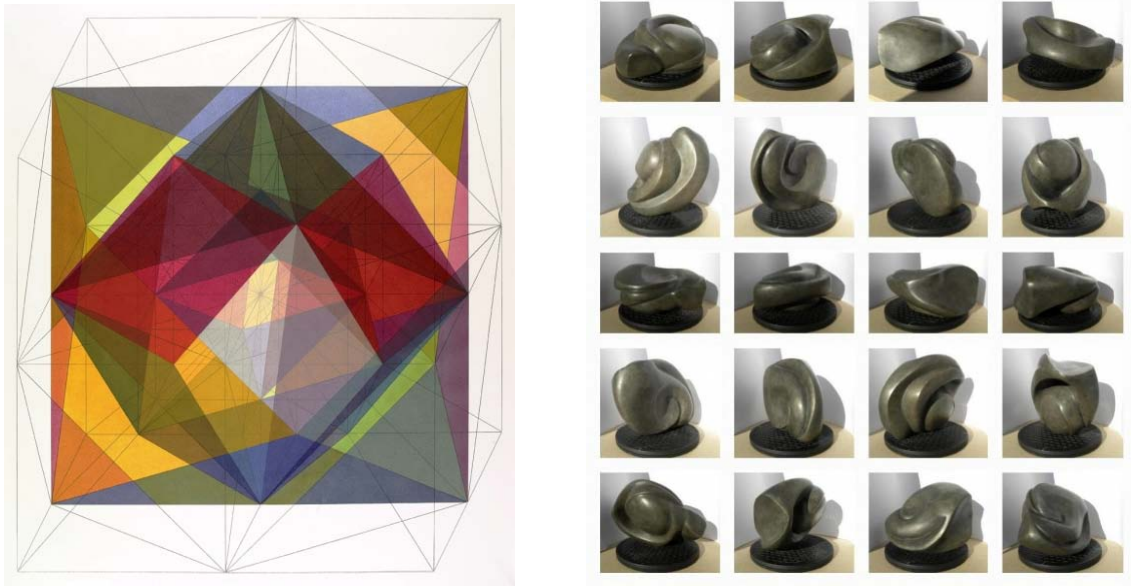
as the artist's statement says, "it is much more of a challenge to convey a natural feeling in such a painting without the feeling of mathematics".



**Figure 3:** *The Official Art Exhibition.*

I have seen some of John Hiigli's work before, and I find his multiple geometrical images visually and intellectually very stimulating. In *Chrome 163* he depicts an aggregate of a series of polyhedra of cubic symmetry, and for me the challenge is to understand how they are related. I cannot avoid thinking about four-dimensional objects, but John assures me that they play no part in his conception.

Another piece that challenges the viewer to apprehend multiple images (what Nat Friedman calls hyperseeing) is *Coquillage* by Jacques Beck. The name indicates that it is inspired by shell forms, and certainly there are some obvious spirals and some other shell-like aspects, but the range of different aspects of a single sculpture is remarkable.



**Figure 4:** (L) *Chrome 163*, John Hiigli, 2005, (R) *Coquillage*, Jacques Beck, 2009.

If you do not like the formal submission procedure, or you missed the deadline, or you want to display some work in progress, there is always some informal space available. This year, for me, the highlights of the informal art exhibition were pieces created by scribing circles onto stainless steel plates. Shine a light onto the plate and an apparently three dimensional image appears to float in front of it. The stainless-steel versions of some of Lajos Szilassi's regular toroids have also stayed in my memory.



**Figure 5:** *The Informal Art Exhibition.*

Another innovation this year was the ScienTile Competition. Since I was a member of the panel of judges (and made the official announcement of the prize-winners) I have a rather special view of this event. It was sponsored by the Zsolnay Porcelain Manufactory, and was inspired by its long and eminent history of producing, among many other objects, decorative tiles. There was a total of 72 designs by 21 artists that included several original and imaginative ideas as well as straightforward decorative tiles of high quality. The winners give some representation of the variety of approaches. Gondos Gabor (third prize) used tiles of non-standard shape that combine in visually interesting ways. Craig Kaplan (second) had what appeared to be a fairly conventional Islamic pattern applied on square tiles, but with the

possibility of fitting them together in a non-obvious way. His use of colour was also particularly pleasing. John Hiigli (overall winner) used his characteristic technique of overlaying transparent colours to achieve a subtle and aesthetically interesting effect.



**Figure 6:** *The Scientile Exhibition.*

Of course there were the regular Bridges extra events: music evening, informal music evening, theatre night, and excursion. The family event does not happen every year, but they have always been a feature of the PAGE conferences in Pécs, organised for the previous three years in preparation for Bridges 2010, and held in the open-air. This year promised to be particularly exciting with so many potential contributors, but unfortunately bad weather was forecast, so a considerably reduced event was held indoors.



**Figure 7:** (L) *Slavik Jablan's exhibition*, (R) *Nagyharsány sculpture park*.

I had attended two of the previous PAGE conferences, so there was little that was new to me in the tour, but I was very happy to visit again some of the attractions of this part of Hungary. I was very impressed by the sculpture park at Nagyharsány the first time I saw it, and it was certainly worth a second visit. Two things were new to me: the Apáczai Education Centre, a school complex apparently attended by almost all the children in Pécs, and the closing of the Sammlung Weltensand exhibition in the cathedral. Elvira Wersche collects different types and colours of sand from all over the world and uses it to construct complex mosaics composed of geometrical patterns on the floors of museums, churches and synagogues. I had seen some of her work at Leeuwarden in 2008, and although I knew about the closing ceremony I had never

experienced it. Within minutes of the completion of a work that has taken days to create it is completely obliterated, as the different types of sand become irreversibly mixed together. Intellectually it is a fairly obvious illustration of the principle of entropy, and the transience of all things, but the emotional impact of experiencing the actual event is very much greater.



**Figure 8:** *The closing of the Sammlung Weltensand exhibition.*

The main reason for the visit to Apáczai Education Centre was to see the Bridges Pécs2010 Giant Zome-sculpture at its permanent place. I enjoy helping with the Zome event that happens every year at Bridges, but usually I am too busy, and this year was no exception. Since it had to be transported the sculpture, which was based on an Islamic design, was rather smaller than in previous years, but, as usual, it was an impressive creation. The reception also included displays of mathematical artwork that had been donated to the centre, with an official thank-you for the artists who had donated their pieces from the Bridges exhibition at the end of the conference.



**Figure 9:** (L) *Building the Zome sculpture,* (R) *The sculpture installed.*

Theatre Night this year was a performance by The Schaffer and Stern Dance Ensemble, who use the medium of dance to explore and communicate mathematical concepts. The evening was entertaining as well as thought-provoking, and thoroughly enjoyed by the audience, which packed the venue. The informal music event, organised by Vi Hart, was as varied as ever, with a selection of Bridges participants displaying an eclectic mix of styles to a high musical standard. The formal event, curated by Dmitri Tymoczko, consisted mainly of modern jazz and improvisation, The Ávéd-Fenyvesi Quartet and *The Well-Tempered Universe* by Sc.Art, based around sounds collected from astronomical sources. I enjoyed it, but it is fair to say that

it did not suite everybody's taste. We also had The ANK Pécs Children Handbell Choir, which had more general appeal, and the staggering virtuosity of Katalin Gál Poór, who performed his own composition based on the opening digits of the decimal expansion of  $\pi$ .



**Figure 10:** (L) *The Schaffer and Stern Dance Ensemble*, (R) *Dmitri Tymoczko*, curator of the music event.

All of this was just the peripheral activity around the main business of the conference, the presentations -- that included a talk by the renowned Hungarian mathematician and the recipient of the Wolf Prize, László Lovász, and a panel by the creator of the Rubik Cube, Erno Rubik. However, at present, while everything is still fresh, my strongest memories are of those papers that I have been particularly involved with, my own, those that I reviewed, those by non-native speakers of English that I edited into a more idiomatic form, and the workshops, which I coordinate. I will need to wait for a year or two to see what is truly memorable. My experience has been that it is often small, apparently insignificant events that come to characterize a particular conference, and it is seldom possible to predict what they will be. More annoyingly, something that I heard or saw at a previous Bridges will become relevant to my own work, and I will need to trawl through several years' Proceedings to find it. I think I will probably remember Antan Kelle's animated sculptures, the destruction of the sand-painting, and being so busy in the first two days that I hardly had time to eat.





**Figure 11:** *So much to do!*

Even if you did not come to Pécs if you have ever been to Bridges you will recognise the special character of the conference I have described. If you have never been to a Bridges conference all I can say is you do not know what you are missing.