

Texts MFO

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Direktor des Mathematisches Forschungsinstitut Oberwolfach,

Proféssor Gerhard Huisken;

Präsident des Königlichen Spanischen Mathematischen Gesellschaft (Antonio Campillo);

Als Antonio Campillo mich im Herbst 2009 fragte, ob ich, aus Anlass der 100-Jahr Feier der Gesellschaft im Jahr 2011, bereit wäre, Imaginary in Spanien zu betreuen, hätte ich nie gedacht, dass ich als einfacher Diener meiner Sache, mit nur den allerbesten Absichten, jemals solch eine Belohnung auf meinen Wegen finden würde, am wenigsten die gänzlich unverdiente Ehre hier an dieser Stelle zu diesem Anlass zu Ihnen sprechen zu dürfen. Ich selbst empfinde meinen Beitrag an dieser grossen Sache als verschwindend gering, stattdessen möchte ich die gemeinschaftliche Leistung der vielen, vielen Leute und der vielen Institutionen hervorheben, die die mächtige Magie von Imaginary spüren durften. Die größte Ehre gebührt Herrn Professor Gert-Martin Greuel, als Begründer des Projekts, Herrn Andreas Matt als internationalem Koordinator von Imaginary, und was Spanien betrifft, Herrn Antonio Campillo, dem Präsident der Königlichen Spanischen Mathematischen Gesellschaft (Real Sociedad Matemática Española). Lassen Sie mich meinen Beitrag an dieser Sache mit den Worten von Don Quixote beschreiben:

"Schurken, Lumpen, Bösewichte können mir meine Ehre nehmen, meine Mühen (Bemühungen, Anstrengungen) und meinen Mut (Geist, Kraft) aber nicht".

2

Please allow me now to switch to English, as my too limited German-speaking competences would be nothing without the help of natives (Silke Okon and Andreas Matt for this occasion).

Index

This Index shows the main points I would like to make:

3 The centenary of the Spanish Royal Mathematical Society was, to a large extent, a celebration of the steady mathematical progress of the country in the last 30 years. The Third European Congress of Mathematics in Barcelona in the year 2000, and the International Congress of Mathematicians in Madrid in the year 2006, were significant international recognitions of that development. Incidentally, in the ICM in Madrid we could enjoy an image exhibit produced by Herwig Hauser and which can be seen as an embryo of Imaginary.

Our mathematical culture, and our culture in general, owes much to the German culture, mathematical in particular. Two illustrations: just look at the picture of a building of the Georg-August Universität Göttingen and one of the University of Barcelona (building of Elias Rogent, 1889) to see where the architect found inspiration. The second illustration is the new book on “The German roots of contemporary mathematics” (in Catalan, by Pilar Bayer, Jordi Guardia and Artur Travessa; Pilar Bayer, and her large school, is well known in the German number theory community).

4

Another more personal example. I came on several occasions to the Arbeitstagung in Bonn, late seventies and early eighties. In the first or second time, Pilar Bayer and I were talking to Jürgen Neukirch (Pilar had been visiting him in Regensburg), on how bad we saw the situation in Spain. Perhaps seeing that we were striving nevertheless to do something about it, he quoted those two verses of Goethe's Faust: "Wer immer strebend sich bemüht, den können wir erlösen". I have never forgotten them; they recur often to my mind.

That quote of Faust by Neukirch was near the lower bound of my academic career. Now, close to the upper bound, these verses of Antonio Machado come to my mind:

Goethe and Machado were “full minds”, in the sense that their thinking and feeling were well integrated. Goethe connected with feeling through reason, Machado connected to philosophy through his deep feelings about life and people.

¡Oh Guadalquivir!
Ich sah dich in Cazorla
auf die Welt kommen;
Heute, in Sanlúcar sterben.
Ein Sprudeln von klarem Wasser,
unter einer grünen Pinie,
warst du, wie gut du da klangst!
Wie ich, nahe des Meeres,
brackiger Flußschlamm,
träumst du von deiner Quelle?

6

I cannot resist to quote another of Machado's poems, popularized by the singer **Joan Manuel Serrat**:

Traveller, your footprints
Are the path and nothing more;
Traveller, there is no path,
The path is made by walking.

By walking the path is made
And when you look back
You'll see a road
Never to be trodden again.

Traveller, there is no path,
Only trails across the sea...

7 Summary of Imaginary Realities

There have been four ...

- **Country-wide autonomous long-term deployments**
 - Germany, **Spain**, Russia, Argentina
- **Limited exhibits (6)**
 - Austria, France, United Kingdom, **Switzerland**, USA, Poland.
- **Limited independent exhibits (6)**
 - Ukraine, Colombia, Portugal, **Serbia**, Panama, China
- **Special activities (workshops, competitions, talks) (4)**
 - **Pakistan**, Israel, India, Greece
- **Permanent Museums (3)**
 - **MIMA**, Deutsches Museum, MoMath
- **Temporary Museums (4)**
 - CosmoCaixa Madrid, **CosmoCaixa Barcelona**,
Museum of Lisbon, Museum of Coimbra

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Near future events

- **Denmark** (140 anniversary Danish Math Society)
 - Opening today in Åarhus
- **Norway**
 - Opening in Trondheim, with 2013 Abel Prize winner Pierre Deligne

Future Strategic Lines

- **Mathematics of Planet Earth**
- **Platform imaginary.org**
(open source, funded by Klaus Tschira Stiftung)

MPE: **Imaginary** is a key ingredient of *Mathematics of Planet Earth*, and international initiative with more over 135 partners around de world. It was presented at the UNESCO in Paris one month ago.

The platform is the basis for involving the international community in producing and sharing high quality content for schools, universities and museums. The enabling tool for such purpose is the new web design: everybody can edit and upload materials.

9 Imaginary in Spain? RSME-Imaginary = Imaginary

RSME-Imaginary CosmoCaixa: First steps were in November 2009, in a visit with Antonio Campillo to Jorge Wagensberg (later Enric Banda and José I. López). Foundation La Caixa  Obra Social "la Caixa"

Visit to MFO in June 2010. Several long sessions with Andreas Matt, that have continued frequently, on skype or email, on many, many occasions.

10

In view of the foreseeable variability of sites in Spain, a key element was to have a 'kubus' that could be reconfigured according to needs. The design was done with Andreas Matt during the 2010 visit to MFO. You can see three examples at work (Valladolid, Bilbao and Barcelona). In practice it had even more flexibility than we envisioned.

11

The shipping of the Imaginary materials from Oberwolfach occurred in January 2011, and went directly to the first site, Salamanca.

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This slide shows the Brownian-like wandering of the mobile exhibit across Spain, from the first site, Salamanca, to the last, Santiago de Compostela.

At all sites it was deployed for about one month, occasionally one or two weeks more, except Granada, where it was included as an exhibit of the Science Park (Parque de las Ciencias) from mid June 2012 till early March 2013 (nearly nine months). The last site so far is Santiago de Compostela, where the inauguration was just three weeks ago and where it will stay until the 16th of May. It has worked remarkably well, much better than what could be expected from so many shippings and so many hands.

13

Read the slide. Stress autonomy, adaptation.

Zaragoza: reconstruction and documentation of German clay models (Klein, Brill), as the photos in the corridor. Barcelona: four modules:

gothic painting, gothic architecture, life of Esteban Terradas, 5 ton clock.

14

Dissemination: read the slide (points that will be commented a bit more in a moment)

15

Official web: rsme-imaginary.es. This slide is the Wann/Wo folder.

16

And this is the page for the RSME-Imaginary Galleries, each with a few pictures.

17

Read the slide.

18

Read slide: Posters of Málaga and Barcelona. In Málaga, the local component was the exhibit “The taste of mathematics”, a set of dishes prepared by the chef José Carlos García that were inspired in images of the exhibit. The pictures were taken by the mathematician-photographer Pedro Reyes. Do not miss his restaurant at Muelle, 1, Málaga, or his Café de París. There was a parallel outside exhibit stressing the metaphoric connection between cooking and doing mathematics. The Imaginary-Málaga coordinator, the soul of all these happy news, was Mercedes Siles Molina. Creativity a la Picasso.

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Another local element: the flyer designed in Santiago de Compostela by the mathematician Javier Barja.

20

Weekly digital Boletín RSME. In this case, with the news of the opening tin Santiago de Compostela.

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Cover of a the Gaceta (2011/2), and composition for an article Gaceta 2012/3 with images form 14 sites.

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Covers of Gaceta 2012/1 (Image of Margarita García, a secondary teacher, and winner of the RSME prize to mathematical form) and 2012/2 (*Panal=Wabe*), image by Andrés Ibáñez, secondary student).

23

Cover Gaceta 2012/3, with the “best image” of the surfer contest, and a picture of his winner, Raúl Alonso (15).

24

Cover of Gaceta 2012/4, with the image *Ohne Name* (Hiltrud Heinrich).

It is worth noticing the variety of the winning profiles (fifteen in all), from early secondary students (like Raúl Alonso, the winner), to secondary teachers (Margarita García, already mentioned) and university teachers (like Asier Muger, con *Insecturs Zomorro*, winner of the RSME prize to modelization), to Hiltrud Heinrich, a retired teacher of Biology and Chemistry, who with *Ohne Nahme* won the SCM prize to esthetics, or to the Iranian painter, designer and photographer Mehrdad Garousi, who won a prize for his *Tetradic Knot*.

Canarias (La Laguna), La Rioja, ...

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Read the index.

26

Read the slide. Main events: family day, lectures, contest. One of the most successful exhibitions at ETH.

Notice the original Kubus.

27 and 28

Read the slides

28

Read the slide.

This was in collaboration with Berlin and the DMV.

29

Many workshops for school teachers. In general very receptive and thankful for the novel ideas. Opened in January 2010. Combines crystallography and mathematics, especially the highlights of Imaginary, on a permanent basis.

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Read the final comments.

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Mit den Augen der Mathematik

Through the eyes of Mathematics

Una mirada matemática

Begirada matematiko bat

VIELEN DANK !!