



Final Report IMAGINARY

Travelling Exhibition by the Mathematisches
Forschungsinstitut Oberwolfach
December 2007 - December 2008

Wissenschaftsjahr 2008

Mathematik
Alles, was zählt

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GEFÖRDERT VOM



Bundesministerium
für Bildung
und Forschung

Final Report 2008

IMAGINARY - Through the Eyes of Mathematics

IMAGINARY is an interactive travelling exhibition designed by the Mathematisches Forschungsinstitut Oberwolfach (MFO) for the Year of Mathematics in Germany 2008. Its intention is to display visualizations, interactive installations, virtual realities, 3D objects and their theoretical background in algebraic geometry and in singularity theory in an attracting and understandable manner. It's a unique experience of science!

The travelling exhibition IMAGINARY has visited more than 13 German cities so far. By its educational layout, IMAGINARY is able to awake interest in the underlying theoretical concepts of mathematics. Its visual impressions and live-interactions can even create elation for mathematics, which is also enhanced by conducted tours and the local mentoring, as well as by the web site and by competitions.

Free exhibitions have taken place in many public areas (universities, railway stations, bank buildings, research institutes, pleasure grounds, centers and fairs), under joint organisation with local partners like advertising agencies, institutes, city councils etc. The local partners have assisted in public relations, supervision of the exhibition and logistics.

IMAGINARY is supported by the Federal Ministry for Science and Educations (BMBF). Further information is available at www.imaginary2008.de.

Venues of Exhibition

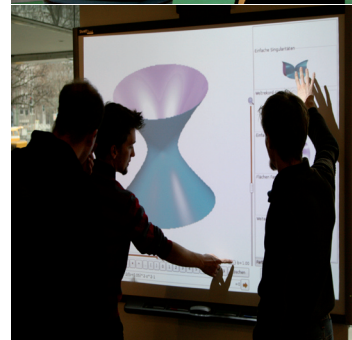
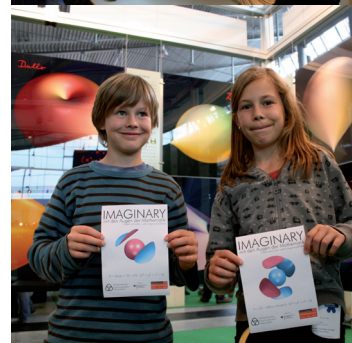
Munich, TU Garching	10.12.2007 - 18.01.2008
Berlin, Urania	19.02.2008 - 06.03.2008
Kaiserslautern, ITWM	10.03.2008 - 11.04.2008
Stuttgart, Ideenpark	17.05.2008 - 25.05.2008
Potsdam, train station	29.05.2008 - 25.06.2008
Leipzig, Science Summer	28.06.2008 - 04.07.2008
Rust/Freiburg, Europapark	08.07.2008 - 30.07.2008
Kassel, Sparkasse	05.08.2008 - 29.08.2008
Cologne, Uni-Mensa	08.09.2008 - 26.09.2008
Munich, LMU	24.09.2008 - 21.10.2008
Constance, BildungsTURM	01.10.2008 - 19.10.2008
Saarbrücken, K4 gallery	24.10.2008 - 16.11.2008
Passau, University	05.12.2008 - 19.12.2008

Special Venues

Munich, Dies Academicus TU	05.12.2007 - 06.12.2007
Berlin, Opening Year of Mathematics	23.01.2008
Berlin, TU	28.01.2008 - 05.02.2008
Berlin, Girls' Day	24.4.2008
Science Exhibition Ship	07.05.2008 - 04.09.2008
Bremen, Kino46	24.05.2008 - 26.05.2008
Koblenz, Science Day	09.06.2008
Halle, Science Night	04.07.2008
Mannheim, Computermarkt	19.07.2008
Salem (USA), Robert Bosch Event	27.07.2008
Jena, Junior Mathematical Congress	04.08.2008 - 08.8.2008
Wissenschaftstage LMU	18.10.2008 - 21.10.2008
Cologne, Closing Year of Mathematics	11.12.2008
Exhibition in Second Live, ART Gallery	14.12.2008 - 01.02.2009

Actions and Projects

Mathekoffer: MFO and MNU Munich have created two posters and three flyers with projects to apply the IMAGINARY mathematical software in school. The material was included to a "math suitcase" for schools which was produced in an edition of 2,500 items.



DFG-DVD: The DVD of the German Science Foundation (Deutsche Forschungsgemeinschaft), which was created for the Year of Mathematics 2008, also contains information and images of IMAGINARY.

Poster-Set: The MFO has published an IMAGINARY poster set displaying 12 algebraic surfaces on a non-for-profit basis. More than 300 sets were already ordered.

Competitions: In cooperation with the established journal "Die Zeit" and the periodical "Spektrum der Wissenschaft" the MFO has arranged competitions in 2008 concerning interesting and attractive pictures which were created by the SURFER software. More than 8,000 pictures were submitted, together with their mathematical formulas.

IMAGINARY in School: Schools are invited to use software of IMAGINARY in instruction. Therefore, a special web site with suggestions was created.

European Mathematical Society: In July 2008, a detailed report on IMAGINARY was presented at a conference in Utrecht (Netherlands) on "Raising public awareness in Mathematics"

Mini-Symposium and teacher education: On September 16th and 17th in Erlangen, a mini-symposium on IMAGINARY and "Techniken aus der Visualisierung in der Geometrie" was organized during the annual meeting of DMV (German Mathematical Society). Moreover, a training for secondary school teachers in mathematics was organized in Oberwolfach in the week Nov. 2nd – 8th, 2008, on the subject "Theory and visualization of algebraic curves and surfaces".

Interactive Advent Calendar: The MFO has created an internet-based interactive Advent calendar which collects visualizations of algebraic surfaces and awards prizes for the best pictures from December 1st – 24th.

Number of Visitors

More than 120,000 visitors have attended the touring exhibition IMAGINARY, including more than 340 school classes which enjoyed special conducted tours. In addition, more than 100,000 visitors attended special exhibitions like that on the "ship of science" (Wissenschaftsschiff) and at particular science days.

Webseite und Downloads

The web site www.imaginary2008.de is permanently updated and extended. Not only information on the exhibition, but also mathematical background and software is freely available for download.

Number of visits: Starting in December 2007 there were 129,521 different visitors with a total of 5,136,312 hits. The daily average is about 400 visitors, with peaks of up to 9,000 visitors on certain days.

Downloads (Highlights):

SURFER software: more than 40,000 downloads

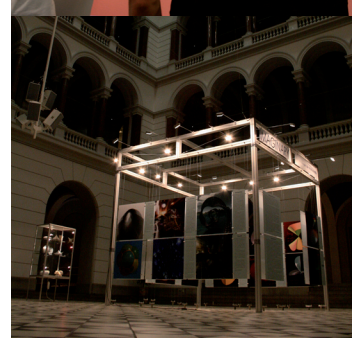
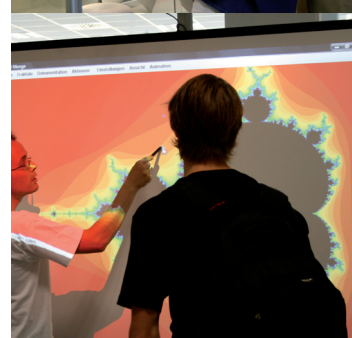
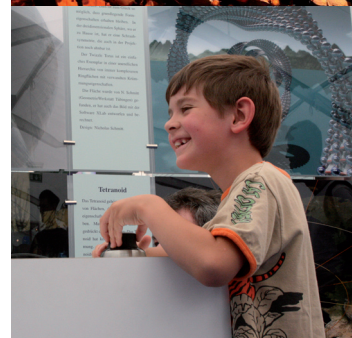
Articles on chaos and reflections: more than 15,000 downloads

Articles on algebraic geometry: more than 10,000 downloads

Journals and Media

Many articles and reports on IMAGINARY have appeared in print media, radio and television. Here is a short selection:

- Berichte im Hessischen Rundfunk 05.08.2008 und im WDR 09.08.2008
- BILD-Zeitung, So schön kann Mathe sein!, 14.07.2008
- Leibniz-Journal, Gleichungen einmal ganz anders - MFO-Wanderausstellung Imaginary, Juni 2008:



- Abendzeitung, Rechnen ist doof? Denkste, 29.06.2008
- PM: Praxis der Mathematik in der Schule, 3 Artikel zum Thema "Algeometrie: Algebra trifft Geometrie", mit Bezug zu Surfer, Juni 2008
- Potsdamer Neueste Nachrichten: Mit den Augen der Mathematik, 30.05.2008
- Bericht im Fernsehsender RBB, Sendung Ozon, 19.5.2008
- Alumni Newsletter der Univ. Kaiserslautern, Highlight of the Year of Mathematics, April 2008
- Bericht im Fernsehsender 3SAT/ZDF, Sendung NANO, 04.04.2008
- Spektrum der Wissenschaft, Das Ausgedachte in Sichtbares umgerechnet, April 2008
- Die Rheinpfalz, Ausstellungseröffnung im ITWM Kaiserslautern, 11.03.2008
- VDI nachrichten, Faszination Zahl - Formeln neu erleben, 22.02.2008
- Süddeutsche Zeitung, Mathe-Formeln mal ganz anders, 13.12.2007

Sustainability

Sustainability was already an important aspect for the MFO at the planning of the exhibition IMAGINARY and at the creation of the exhibits. For example, a long-lasting usage of the software by pupils and in school should be achieved. The exhibition should continue also after the Year of Mathematics 2008. Moreover, it makes sense to transfer the exhibits to a permanent exhibition or to a museum like the projected museum "M2 - Mathematik und Mineralien" in Oberwolfach.

Furthermore, the scheduled "science train" of the Leibniz Association and the Max-Planck-Society in 2009 has shown interest in IMAGINARY, as well as the German Museum in Munich. Also, already now a lot of concrete inquiries have been made to arrange an exhibition in 2009-2010 in further German cities and also in other countries (Austria, Switzerland, Italy, Netherlands, Ireland, USA). An exhibition book "IMAGINARY - through the eyes of mathematics" will be printed.

Links and Hints

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|---|---------------------------------------|
| [1] www.imaginary2008.de | Exhibition IMAGINARY |
| [2] http://surfer.imaginary2008.de | Program Surfer |
| [3] http://unterricht.imaginary2008.de | Surfer in School |
| [4] www.zeit.de/matheskulptur | Surfer-Competition at ZEIT Online |
| [5] www.spektrum.de/mathekunst | Competition Spektrum der Wissenschaft |
| [6] http://poster.imaginary2008.de | IMAGINARY Poster Project |
| [7] http://www.imaginary.mnu.de/ | Mathekoffer Project |
| [8] http://imaginary2008.de/minisymposium | IMAGINARY at the DMV meeting |
| [9] http://advent.imaginary2008.de | Interactive Advent Calendar |

Citations from the IMAGINARY Guests' Book

This beautiful exhibition is very lively because of the excellently guided tour.

Math makes you happy

Excellent, in particular the fact that the software can be used in school

Fantastic! Great guidance!

An amazing exhibition. I have spent a lot of time here and I got to know many beautiful things. This should happen more often, actually this should be a permanent exhibition. Thanks and keep it up!

This exhibition is wonderful and beautiful.

The strange world of mathematics is not easy to understand. But here, one gets closer to it.

I don't like to go to a museum, with the exception of this one.

We came again because it was so fascinating!

Perhaps I should have studied mathematics however ...

Simply marvellous, the software is cool!

This is fascinating - I wish I would have experienced this in school ;)

We are just lost for words! Thanks for the good guidance.

This gives a clear demonstration for the beauty of mathematics!

