

KuBus 69

Faktor X – The Fraunhofer-Gesellschaft and the Digital Future

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00'06"

He has changed the world of sound and music.

He is a scientist and works at the Fraunhofer Institute in Ilmenau.

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He and his colleagues have invented something which has delighted music lovers and driven the music industry to despair.

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Because of his invention he is now seen as a kind of ambassador for German technological research.

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Back in the early 90s, Karlheinz Brandenburg and a team of researchers started thinking about the future of digital music.

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They came up with two ideas. The first one was a complicated audio data compression system. But with their second idea they struck gold.

00'42" Interview Transcript (IT): Karlheinz Brandenburg, Fraunhofer Institute

"We hoped it was going to be big. How big it will turn out to be is anybody's guess. I still feel the urge to pinch sometimes myself, just to make sure it isn't all a dream."

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And what exactly did Professor Brandenburg invent?

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He kept squeezing music data down until it fitted into a handy format – but without causing any loss of quality to the music:

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Finally, the amount of data required to store a piece of music was reduced to the extent that you could put it anywhere – on the internet, for example."

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The researchers gave their invention a simple name. Then they waited to see what would happen:

01'24" IT: Karlheinz Brandenburg, Fraunhofer Institute

"Looking back now, coming up with MP3 was like hitting the jackpot."

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That is certainly true for the researchers themselves and for their employer, the Fraunhofer Institute.

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But for those who make money from music, it was a different story.

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Music was suddenly available free of charge. And Brandenburg, his colleagues and their employer were famous:

01'51" IT: Karlheinz Brandenburg, Fraunhofer Institute

"Music is no longer a slave to a medium."

01'54"

"It's now much, much easier to take music with me wherever I go – thanks to MP3 players."

02'00"

"Because of MP3 – and many other significant developments, of course – I'd say that Fraunhofer now has a reputation in Germany for being *the* place where exciting stuff happens."

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And that's a reputation worth defending. Brandenburg has been devoting himself to other projects for quite some time now – or to be more precise, to another revolution: this time, he wants to revolutionize the cinema.

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The studios in Hollywood have been dreaming about it for years:

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a completely digitalized cinema – digitally filmed and digitally screened.

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It would save money and generally make a lot of sense. But up till now, it was restricted to the realm of fantasy.

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And besides, the cinematic revolution doesn't have to take place in Hollywood.

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Why not in Ilmenau? There's a movie theater here too.

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But with Professor Brandenburg and his colleagues from Fraunhofer working next door, it's not just any movie theater, of course.

02'59" IT: Karlheinz Brandenburg, Fraunhofer Institute

"This is our IOSONO movie theater – it's the only one in the world so far to be equipped with this technology. IOSONO is a three dimensional sound system which enables you to fill a room, a movie theater, with sound. This is something none of the previous technologies are capable of."

03'21"

IOSONO is based on a scientific principle known as Wave Field Synthesis. It is the result of extensive research into human hearing, carried out using complicated acoustic models. The result is a sound environment more realistic than anything previously heard in movie theaters:

03'37" IT: Karlheinz Brandenburg, Fraunhofer Institute

"By taking individual sound waves from the individual loudspeakers located around the room and superimposing them on top of each other, IOSONO produces a sound field which is very close to reality."

03'51"

And the quality's the same wherever you sit. In this regard, IOSONO is vastly superior to all previous systems – even the ones from Hollywood.

04'03" IT: Karlheinz Brandenburg, Fraunhofer Institute

"I have the sound of an orchestra with violins here and cello there and percussion behind them. It remains constant – it doesn't matter if I'm here in this part of the room, or if I move around, or if I listen from the other side.

04'21"

IOSONO is only one part of a larger project dedicated to the future of the cinema. The researchers at Fraunhofer intend to change the face of cinema as we know it.

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Approximately ninety miles south of Ilmenau, in the Bavarian city of Erlangen, there is another Fraunhofer Institute. It's Professor Brandenburg's old stomping ground.

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Here, he worked on integrated circuits, a further specialized field within the Fraunhofer-Gesellschaft.

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Die Fraunhofer-Gesellschaft has been in existence since 1949. What started off as a three-man operation now comprises 80 institutes in 40 locations in Germany and around the world.

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Approximately twelve and a half thousand employees carry out and support applied research in almost every scientific field.

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Working on behalf of and in cooperation with both the commercial and public sectors, Fraunhofer searches for and finds solutions to problems of the present and the future.

05'27"

Applied science also means finding solutions to problems which have seemed unsolvable until now.

05'33"

Like finding a technical solution which will one day make unclear or doubtful refereeing decisions a thing of the past in soccer.

05'42"

There are almost no limits to Fraunhofer's research activities.

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While their colleagues in Ilmenau deal with sound, the team here in Erlangen is working closely with one of the leading camera manufacturers on the development of the film camera of the future.

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Their problem: celluloid film has picture carrying qualities which even the most cutting edge electronics cannot compete with.

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Wide contrast range, soft defocus transitions, variable deep focus and – above all – very, very high definition.

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In order to achieve the same quality electronically, you would have to produce a picture with a definition 20 times greater than that of a normal TV picture.

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HD is the magic word: high definition pictures. In order to achieve this, huge amounts of data have to be stored.

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In the past, computer memories the size of refrigerators were required to do this job, but at Fraunhofer, they are gradually bringing the size down to more practical proportions.

06'42"

Since the various problems are intertwined, five Fraunhofer Institutes formed an alliance for the specific purpose of working on the digital cinema of the future:

06'55" IT: Hans Bloss, Fraunhofer Institute; spokesman, Allianz Digital Cinema

"We quickly recognized that digital cinema does not only consist of one piece of equipment: it's made up of a variety of technical skills and complex production processes – starting with the camera technology on through post-production, archiving, distribution of the film stock, right down to projection. This means the Institute has to make use of a whole range of skills, and these are not concentrated in one location – they're spread around various different institutions. But they are all part of the Fraunhofer-Gesellschaft."

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But apart from the new Fraunhofer camera, Germany is trailing behind a little in the international field of HD development.

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The new technology is rigorously put to the test at workshops and seminars.

The main problem is trying to answer the question bugging all dyed-in-the-wool movie nuts: Will the somewhat cool and smooth electronic pictures ever be in a position to drive the more alive film pictures out of the cinemas?

08'00" IT: Thomas Bresinsky, director/cameraman

"You can't really say that film is better than HD, or that HD is better than film. I think that's something you have to discuss with the director. You have to consider the kind of look you want to have. I think there are definitely certain documentaries and feature films which are shot in 16 millimeter because it gives them a particular look. But there are also films, even cinema films, which come out fine if you shoot them in HD – because it also gives them a particular special look."

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Extensive research, high-tech, new esthetic parameters. But one question still remains unanswered: Who exactly will benefit from this digital battle of materiel in the cinema of the future?

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It could especially give a big boost to the so-called "small" movie theaters, the art house cinemas and the authorial film.

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Downtown Berlin is the location of Edition Salzgeber, a small film distribution company specializing in documentaries, art house movies and minority interest film programs.

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The program is called "delicacies" – cinema for gourmets. The new technology made it possible.

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While Hollywood is still dreaming about a fully-digitalized cinema, there has been one up and running here for quite some time now.

09'26" IT: Björn Koll, Edition Salzgeber

"That's exactly what we do here: we think about how we can get a small-scale Bulgarian documentary onto a German cinema screen – or vice versa. Because there's one thing you must never forget: these days you always have to think about processes such as these on a European level – on a global level. And this is exactly the point we're trying to make with "delicacies": we're saying, "Here's the technology – it can do the job wonderfully." It shouldn't really concern the audience. They shouldn't notice whether the film is being screened digitally or analog or whatever.

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Normally, you have to have hundreds of expensive celluloid copies made, which are then shipped off around the world in big, heavy packages.

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A "delicacy" is a much easier proposition. You could say it comes in sandwich format, with a simple, handy hard disc inside.

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The distributor provides the digital technology, and the cinema shows their movies in return.

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It is a system with high aspirations:

10'27" IT: Björn Koll, Edition Salzgeber

"You know the story: the saying goes that whenever someone in Burbank or Hollywood coughs, the whole world watches the same piece of trash or the same fantastic movie – depending on your point of view. But there should also be room for European films, African films – whatever. There should also be room for films which don't fit into the category of family entertainment."

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The distributor also provides the video projectors, which would otherwise be prohibitively expensive.

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But – and this brings us back to Fraunhofer – research is being carried out in this area too.

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If you take several ordinary commercially available home theater projectors and connect them up using a special piece of software, they can produce a single, high definition picture.

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This could be a chance for the movie theaters to beat their biggest rivals – the home theaters – at their own game.

11'20" IT: Hans Bloss, Fraunhofer Institute; spokesman, Allianz Digital Cinema

"For financial and technical reasons, an extensive technical installation – such as a new sound system, a three-dimensional picture experience, an interactive cinema, a live show, for example – will initially only be able to take place in a movie theater. Of course, these new technologies will eventually find their way into people's homes. But the cinema has always done the trailblazing."

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But if the cinemas want to keep the home theaters off their backs in the future, they will have to think even further ahead.

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Using the new technology, the makers of "Delicacies" are showing the "Ring of the Nibelungen" digitally at their cinemas. Eighteen hours of opera in several parts.

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And why not show soccer, boxing matches or the Olympic Games at movie theaters if the digital technology allows them to be shown in a previously undreamt of quality?

12'19" IT: Karlheinz Brandenburg, Fraunhofer Institute

"Say there's a big concert on and a million people want to go to it, but the largest stadium only holds a hundred thousand people. I could create a really electric atmosphere in a number of cinema auditoriums, bring the atmosphere of the soccer stadium right into the cinema and create a whole new area of demand in the process."

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Digital technology can make the cinema more flexible and diverse. Wagner with popcorn and in evening dress – why not?

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Because this is the only way the cinema will be able to maintain its position as a major player in our culture in the future. Everyone involved is convinced of this.

13'06" IT: Björn Koll, Edition Salzgeber

"I'm planning even greater acts of madness. I'm going to put on readings in movie theaters. I'd like to see discussions taking place there, too. I've absolutely no problem with showing TV content while the shows are still going out on TV. I'd like to see cinemas fulfill a social function, act as a meeting place where people get together, argue, exchange views. And that's my mission from cinema to cinema. I'm fighting against people turning into couch potatoes and staying at home to watch things."

13'46" END

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