

When Science meets Design

Knowledge



One of the most important frontiers in contemporary design is devising ways to apply science in new and practical ways. Last

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night at Mediamatic in Amsterdam a scientist and a design author presented their current research for the audience to consider. Just how can these two disciplines better cooperate?



By Gabrielle Kennedy / 05-12-2013

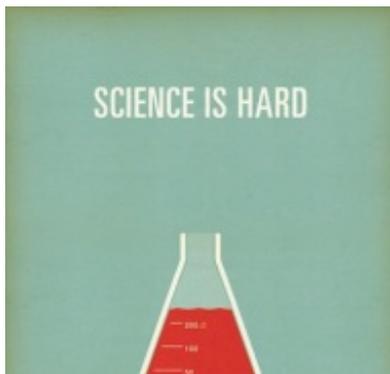
Dr. Toby Kiers is an associate professor of Evolutionary Biology at the Vrije University in Amsterdam. Her specialty is conflict and cooperation in microbes – non-cognitive organisms.

It is a topic that meets with grave scepticism amongst her peers. “But I wonder, does scepticism shut us off from our peers?” asks Kiers. “Does it close us off to new ideas?”

A designer might say yes, but designers – to be fair - are not trained to be rigorous scientists. They can freely engage and even indulge in the experimentation of exceptions and breaking the rules.



Daan Roosegaarde is the most interesting designer/artist currently collaborating at full steam with science. He sees it as the only way forward, but does point out that the different mind-sets that propel science and design can clash. “Scientist sometimes have a tendency too loose themselves in too much detailing,” he says today from Hong Kong. “This can be great, but in the beginning of a concept you sometimes need a more global overview. Me using words such as 'improvise' has generated many bewildered looks.”



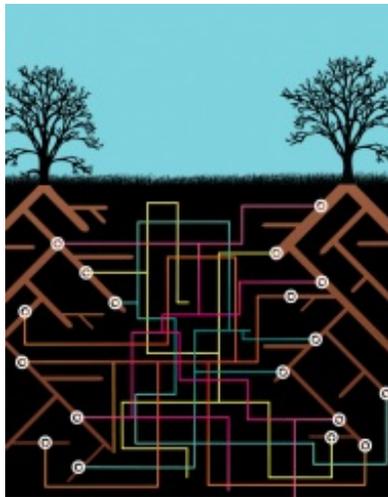
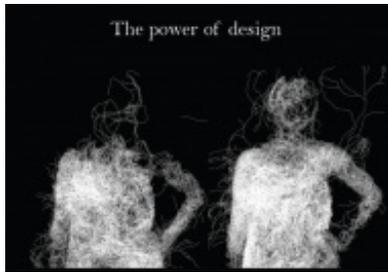
Last night Dr. Kiers doesn't disagree emphasizing that plotting a mutually beneficial relationship needs to happen now. She says science moves cyclically between times that rely on existing ideas, which is where we are now, and times when radically new ideas are embraced. Perhaps, she suggests, it is with the more free-thinking input of art and design that contemporary science can catapult into a more radical era.

“The only way forward is to engage with other fields,” she says. “My only stipulation is that designers understand that there are core scientific principles from which we work that can never be

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compromised.”

The beautiful irony here is that Kiers’ specialty is researching why micro-organisms cooperate for their mutual benefit. She adds that working out how cooperative behaviours evolve is one of science’s ten top unanswered mysteries. “It is just something we do not yet know,” she admits.

Kiers presents her complex research in a diluted and accessible way that wows her non-scientific audience. She likens the dynamic web of microbial life that flourishes beneath the ground we walk on to an economic market and uses illustrations that at first glance look to have been swiped from the pages of an economic journal.

“You need complex reasoning to bargain in the microbial world in order to get a good deal,” Kiers says. “Fungi exhibit market strategies and all without cognitive abilities.”

These networks have been around for 450 million years but how they evolve is still not known. “That is what we are working on,” says Kiers. “My lab’s research into this can be used in agriculture, industry and medicine, and as we discover more, it can also have a big impact on design.”

Where Kiers excels is where too many scientists fail: communication. In just thirty minutes she managed to distil some of the most complex scientific notions down to digestible nuggets that inspire her audience. And it is not just the non-scientific public who struggle to have any clue what science is currently about. Scientists often do not even understand each other. Kiers admitted that at a conference in Germany recently a colleague told her that they aim for 50% understanding – and that’s between scientists!

To further her reach and create even better understanding Kiers asked Design Academy Eindhoven graduate **Niels Hoebbers** to make an **animated film** for her presentation. It was Hoebbers first time working with a scientist. “I had to translate scientific research into a visual story,” he says. “When I work, my imagination is triggered, and there are moments when I want and need to make aesthetical choices, but with science you have to stick so closely to the facts. Usually my approach is more abstract, and therefore more free, but for science it is different. In the end it worked well and I do think Toby and I reached a good understanding.”





“For one small bit not even she knew how the ideas work so there we came up with a logical albeit creative solution that wasn’t really scientific,” he adds with a smile.



William Myers who Design.nl already spoke to [here](#) was the second speaker in last night’s event. He raised interesting points in his presentation about the public’s perception of science and particularly biology.

“In the US we have become obsessed with purifying our environments,” he says. “Even in advertising the emphasis is on sanitizing space ... we have fetishized cleaning.”



He points out that change, albeit coming, is slow and that the public must embrace biology in their designed worlds for a proper collaboration between science and design to flourish. Only when the public feels comfortable living with biology will the necessary subsidies, taxes and incentives come to allow a lot of the experimental projects he talks about in his book to be realized.



Myers presented slides of bridges made from roots, probiotic buildings and fungi replacing Styrofoam as a packaging material. It wowed the audience. He also spoke at length about how concrete can be laced with bacteria that are activated when cracks appear. The oxygen stimulates limestone formations that fill in the cracks thus extending the life of the concrete.

So a closer collaboration between science and design is in the works. “Designers and scientists speak different languages, but this is changing,” Willem Velthoven, Director of **Mediamatic** who hosted last night’s event says. “It needs to be chartered and developed. I have experienced first-hand trying to match together a scientist and a designer doing amazing work in the same field and watched as silence ensued. They really had no idea how to talk to one another.”

There is also a synchronization issue. It can take over one year of planning to get funding for scientific research. In design there is more immediacy. “A designer gets an idea and can immediately start experimenting in his or her studio,” says Velthoven. “The far slower pace of scientific research can be excruciating for a designer who is generally a doer.”

Velthoven has set up a formal collaboration between Mediamatic and the science department at Utrecht University. “We have PhD students collaborating with our artists and designers and the project is funded by both science and art/design money,” he explains.

The classical model has always been for pure scientific research to be done – only then could it be applied. “But now we want an earlier collaboration,” says Velthoven. “Both designers and scientists working together from the start so that designers can actually inform the research by asking their questions earlier.”

The reaction from the scientists at Utrecht University has been very positive. “They understand that it enriches their world of possible scenarios,” Velthoven says. He is also quick to point out that Kiers immediately accepted his request for her to join the Mediamatic Board of Advisors.

Kiers, however, still believes that the science has to come first. “But scientists need to be open to it,” she emphasizes. “We need to be approachable, and make room in our research agenda for radical ideas. We need to be pushed to do frontier science - not punished because it doesn't yield results immediately.”

Images

Main: slide from speech Toby Kiers

Left hand side:

1 Toby Kiers at Mediamatic, Amsterdam

2 William Myers at same venue

3, 4, 5 slides from Toby Kiers

6 "the underground marketplace", slide by Toby Kiers

7 Ancient rootbridges of Meghalaya, India

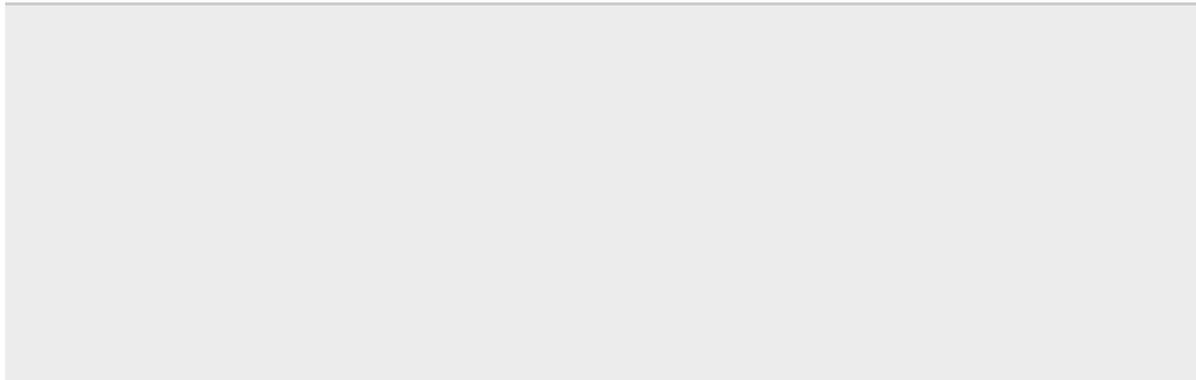
8 Biomilano: 'vertical forest', by Stefano Boeri Architects

9 Packaging material grown from mycelium, by Ecovative

10 BioConcrete, by Henk Jonkers, Technological University Delft

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